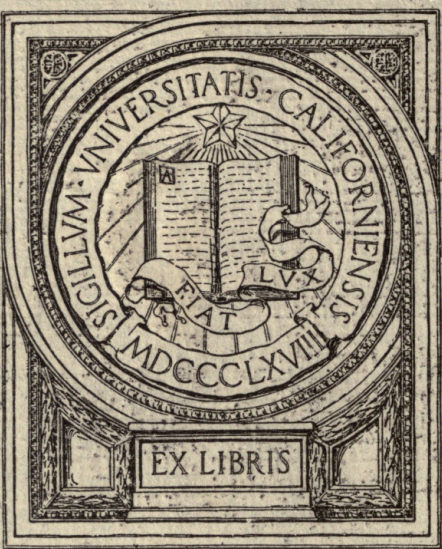


UC-NRLF



B 4 500 324



EX LIBRIS

537
227
K.E.M.

TESTS FOR COAL-TAR COLOURS IN
ANILINE LAKES.

GRIFFIN'S TECHNICAL PUBLICATIONS.

- Treatise on Colour Manufacture.** By GEORGE ZERR and Dr RUBENCAMP, and Dr C. MAYER, of Burgdorf. 30s. net.
- Painting and Decorating.** A Complete Practical Manual. By W. J. PEARCE. THIRD EDITION, Revised and Enlarged. 12s. 6d.
- Painters' Colours, Oils, and Varnishes.** By G. H. HURST, F.C.S. FOURTH EDITION. 12s. 6d.
- Painters' Laboratory Guide.** By G. H. HURST, F.C.S. In Cloth. 5s.
- Ink Manufacture.** By C. A. MITCHELL, B.A., F.I.C., and T. C. HEPWORTH. In Cloth. With Plates and Illustrations. 7s. 6d. net.
- A Manual of Dyeing.** By E. KNECHT, Ph.D., CHR. RAWSON, F.I.C., and R. LOEWENTHAL, Ph.D. SECOND EDITION, Thoroughly Revised and Re-written. 45s.
- Synthetic Dyestuffs, and the Intermediate Products from which they are Derived.** By J. C. CAIN, D.Sc., and J. F. THORPE, Ph.D. In Large 8vo. Cloth. Pp. i-xv+405. 16s. net.
- Dictionary of Dyes, Mordants, and other Compounds.** By CHR. RAWSON, F.I.C., W. M. GARDNER, F.C.S., and W. F. LAYCOCK, Ph.D. In Large 8vo. Cloth, Library Style. 16s. net.
- Dyeing and Cleaning.** By FRANK J. FARRELL, M.Sc. In Cloth. With 76 Illustrations. SECOND EDITION. Enlarged. 5s. net.
- Bleaching and Calico Printing.** By GEORGE DUERR, Assisted by Wm. TURNBULL. Cloth. 12s. 6d.
- Physico-Chemical Tables.** By J. CASTELL-EVANS, F.I.C. Vol. I.—Chemical Engineering. 24s. net. Vol. II.—Chemical Physics. *Shortly*.
- Foods: Their Composition and Analysis.** By A. W. and M. W. BLYTH. SIXTH EDITION. 21s.
- Poisons: Their Effects and Detection.** By A. W. and M. W. BLYTH. FOURTH EDITION. 21s. net.
- Flesh Foods (Chemical, Microscopical, and Bacteriological Examination).** By C. A. MITCHELL. 10s. 6d.
- Dairy Chemistry.** By H. DROOP RICHMOND, F.I.C., Chemist to the Aylesbury Dairy Co. SECOND EDITION.
- Dairy Analysis.** By H. DROOP RICHMOND, F.I.C. Crown 8vo. Illustrated. 2s. 6d. net.
- Milk: Its Production and Uses.** By EDWARD F. WILLOUGHBY, M.D. 6s. net.
- Elementary Agricultural Chemistry.** By HERBERT INGLE, B.Sc. Illustrated. 4s. 6d. net.
- The Principles and Practice of Brewing.** By Dr W. J. SYKES. THIRD EDITION, Revised by A. R. LING, F.I.C. 21s. net.
- Technical Mycology.** Dr F. LAFAR. SECOND EDITION. In Two Volumes.
- Ferments and Their Actions.** By C. OPPENHEIMER. Translated by C. A. MITCHELL, B.A., F.I.C. In Cloth. 7s. 6d. net.
- Peat: Its Use and Manufacture.** By P. R. BJÖRLING and F. T. GISSING. Illustrated. 6s. net.
- Commercial Peat: Its Uses and Its Possibilities.** By F. T. GISSING. In Crown 8vo. Cloth. 6s. net.
- Chemistry of India Rubber.** By C. O. WEBER, Ph.D. THIRD IMPRESSION. 16s. net.
- The Manufacture of Rubber Goods.** By ADOLF HEIL and Dr W. ESCH. Translated by E. W. LEWIS, A.C.G.I. 10s. 6d. net.
- Glue, Gelatine, and their Allied Products.** By THOMAS LAMBERT. In Large Crown 8vo. Fully Illustrated. 5s. net.
- Leather Trades' Chemistry.** By S. R. TROTMAN, M.A., F.I.C. In Handsome Cloth. Fully Illustrated. 15s. net.
- Handbook for Cement Works' Chemists.** By FRANK B. GATEHOUSE, F.C.S. In Handsome Cloth. 5s. net.
- Gas Manufacture.** By W. J. A. BUTTERFIELD. Vol. I., 7s. 6d.; Vol. II., *Shortly*.

TESTS FOR COAL-TAR COLOURS IN ANILINE LAKES:

A REVIEW OF THE COAL-TAR COLOURING MATTERS
GENERALLY USED IN THE LAKE INDUSTRY AND
THEIR BEHAVIOUR WITH DISTINCT CHEMICAL
REAGENTS

BY

GEORGE ZERR.

AUTHORISED ENGLISH EDITION BY

DR CHARLES MAYER,

EDITOR OF THE ENGLISH EDITION OF ZERR U. RUBENCAMP'S
"COLOUR MANUFACTURE."



LONDON:

CHARLES GRIFFIN & COMPANY, LIMITED,
EXETER STREET, STRAND.

1910.

TP914
Z 5

70 1000
41000000

PREFACE TO ENGLISH EDITION.

THE manufacture of lakes from coal-tar colouring matters (shortly called aniline lakes) has grown to such an extent that it forms to-day a special industry. By the marvellous development of the aniline colour industry the number of possible and actually manufactured lakes is exceedingly great, so that their analysis is becoming at times a difficult work, the more so as the so-called combined lakes containing several colouring principles together are now produced by nearly every maker.

The method of George Zerr of testing for coal-tar colours in aniline lakes (shortly mentioned in Zerr and Rubencamp's *Colour Manufacture*) is an excellent help to the analyst, and is becoming more and more appreciated. Everyone interested in the colour industry will, therefore, find in the following pages, dealing with this method and suitably brought up to date by the translator, a useful addition to the work on *Colour Manufacture* published two years ago by the same firm.

CHARLES MAYER.

BURGDORF (SWITZERLAND),
August 1910.

PREFACE.

THE absence of any literature dealing with the analysis of aniline lakes—an operation carried out every day in important colour-works—was my inducement for studying during a series of years the behaviour of the colouring matters generally used in the lake industry with certain chemicals. The first requirement was to characterise the colouring principles by the simplest methods consistent with their ready recognition by the same means when occurring as lakes. The large number of colouring matters examined enabled me to arrange the following tables, wherein the differential characters of each member of the same class form the key to the analysis of aniline lakes, even of those which contain several colouring principles.

Part I. of this book deals exclusively with the reactions produced by solvents and a few other chemical reagents on lakes from coal-tar colours. The solvents used are *hot water*, *alcohol*, and *acetic acid*, and the other reagents selected are solutions of *caustic soda* (12° Bé. and 40° Bé.), *sulphuric acid* (66° Bé.), and a hydrochloric acid solution of tin salt ($\text{SnCl}_2 + \text{HCl}$). A study was also made of the behaviour of the lakes towards oil of turpentine, linseed oil varnish, and direct sunlight.

The so-called standard lakes were used for these precipitations, and on p. 213 full details and practical directions are given with regard to their preparation, naming, storing, etc. In the Tables forming Part I., col. 1 mentions the colouring matter, col. 2 the carrier, col. 3 the precipitant used, col. 4 the approximate shade of the lake specified, which may, under some conditions, differ materially from that of the colouring matter used.

It was not always possible to test all the brands of a group of colouring matters manufactured by the firms under the same name, but when the coal-tar colours are important for forming lakes or are extensively employed their numerous brands were tested, preference always being given to those firms known to be the actual makers (see Orange II., scarlet, crocein, etc.). Part I. gives the tests with 332 coal-tar colours used for 412 distinct lakes, but there are still gaps—for instance, the alizarine red lakes, a few “ice colours,” and some brands of the most recent colouring matters—which, for various reasons, could not be considered.

Part II. shows the application of the reactions given in Part I. It is assumed that the analyst has found one or more of these reactions in the aniline lake being investigated, by means of which the colouring matters are to be recognised as indicated in the Tables IV.–XIV. The Tables are self-explanatory of the method of procedure, but a key may be sketched as under:—

Analytical Key.	The Colouring Matter is shown in
1. Tests for solubility in hot water, alcohol, and acetic acid.	} Tables IV.–XI.
2. Reaction with sulphuric acid— Operation I. } Part I., further colour " II. } indicated. " III. } Ether reaction.		} Table XII.
3. Reactions with caustic soda— (a) Of 40° Bé. (b) Of 12° Bé.	} Table XIII.
4. Rate of colour change as shown by the hydrochloric acid solution of tin salt.	} Table XIV.

The study of the Tables in Part II. is much facilitated by preliminary tests with standard lakes made for this purpose in the laboratory. By means of the reactions indicated in the various Tables, one or more colouring matters are tested for according to the analytical key. These tests make the determination of a colouring matter a remarkably simple process, while by reading only the Tables their application for analysing purposes seems to be rather complicated. For this reason the text explaining the

Tables does not give unnecessary details, especially those of a theoretical nature, thereby making them easy and not confusing to the reader. Additional help is afforded by a careful study of the three very fully detailed examples of analyses from aniline lakes given on pp. 212, 222, 226.

ERRATUM.

Page 70, *for* Bordeaux G *read* Bordeaux O.

CONTENTS.

PART I.

	PAGES.
Introductory	1-7
Reactions of aniline lakes—	
A. Yellow and brown lakes	8-25
B. Orange lakes	26-37
C. Red lakes	38-111
D. Violet lakes	112-125
E. Blue lakes	126-159
F. Green lakes	160-169
G. Appendix Table	170-171

PART II.

General	173
Classification of the coal-tar colour lakes according to solubility	175
Table I. Reactions with hot water	176-178
" II. Reactions with alcohol	179-180
" III. Reactions with acetic acid	181
" IV. Class I.: Precipitated coal-tar colours, soluble in hot water, alcohol, and acetic acid	182
" V. " II.: Precipitated coal-tar colours, soluble in hot water and alcohol, insoluble in acetic acid	183
" VI. " III.: Precipitated coal-tar colours, soluble in hot water and acetic acid, insoluble in alcohol	183
" VII. " IV.: Precipitated coal-tar colours, soluble in hot water, insoluble in alcohol and acetic acid	184
" VIII. " V.: Precipitated coal-tar colours, soluble in alcohol and acetic acid, insoluble in hot water	184-185
" IX. " VI.: Precipitated coal-tar colours, soluble in alcohol, insoluble in hot water and acetic acid	186
" X. " VII.: Precipitated coal-tar colours, soluble in acetic acid, insoluble in hot water and alcohol	186-187
" XI. " VIII.: Precipitated coal-tar colours, insoluble in hot water, alcohol, and acetic acid	188-189
" XII. Reactions of the coal-tar colour lakes with sulphuric acid, 66° Bé.	191-203

	PAGES.
Table XIII. Reactions of the coal-tar colour lakes with caustic soda (12° and 40° Bé.)	204-211
Remarks on Tables XII. and XIII.	211-214
Example of an analysis of a lake containing only one colouring matter	212-213
Standard lakes: Preparation, stocking, application	213-214
Table XIV. Reactions of the coal-tar colour lakes with a tin salt solution	215-222
Examples of analyses of combined coal-tar colour lakes	222-226
Table XV. Coal-tar colour lakes specially fast to light	227
Index to Part I.	228

TESTS FOR COAL-TAR COLOURS IN ANILINE LAKES.

PART I.

THE problem of examining an aniline lake for its colouring principle, when one or several coal-tar colours are present, is sometimes nearly impossible, especially because the literature on the subject has hitherto had no reliable guide, the topic not having been adequately dealt with notwithstanding its great importance. Hence it happens that the analyst, relying mainly on conjecture and accidental conditions, often spends days, and sometimes even weeks, in making fruitless laboratory tests, until he, by a happy chance, finds a character more or less special for the colouring matter he is endeavouring to identify. The tiresome groping involved by the lack of system, often not fully recognised by the managers of some colour-works, must damp the ardour of the young technical chemists at present complained of so much, and yet little or nothing is done by the authorities towards removing this difficulty.

It is an error to assert that experts have no knowledge of good characters for definitely determining the colouring principles in lakes from coal-tar colour. If these are not so distinct as those used, for instance, in inorganic qualitative analysis, the experts are fully cognisant of the distinctive behaviour of the coal-tar colour groups, as well as of the individual members of those groups, towards certain selected reagents, such as alcohol, sulphuric acid, caustic soda, and others. It is at present the custom for experts to draw up private schemes for an easy systematic analysis of lakes. If this is not prominent at present, it is not inconsistent with the assumption that the possible injury to business by the divulgence of secrets is the primary cause which prevents an open exchange

of ideas and methods amongst the experienced technical chemists of the branch; otherwise it is inexplicable why the young work-analysts are allowed to carry on their laboratory tests for weeks and to search the mazes of the literature for days with such little avail rather than co-operate in drawing up a simple method of analysis for rapidly determining the coal-tar colouring matter in a lake, which, like analytical work generally, could be used by all workers. Apart from the fact that, notwithstanding this exclusiveness, the colour chemist has plenty of opportunities of making improvements in his own department, the industry would welcome a simple, reliable process for testing the colouring principles of coal-tar colour lakes, as this would soon free the trade from a certain number of inferior products which have led to a lack of confidence in the colours, and rightly so, for, owing to the difficulty of quickly testing them, they are often bought and partly used before any remedy can be applied. By means of a reliable and given method of analysis, prudence could be exercised in trading low-class goods, the troublesome laboratory work be simplified, and more energy would be available for profitable work. The conclusion is that the importance of the work is sufficient to over-rule the objection to co-operation for this purpose. The first important systematic scheme showing the behaviour of the coal-tar colours towards reagents was given in the pamphlet issued by the Hoechst Colour-works* for the guidance of their customers as to the character of the colouring matters made by them, the usefulness of which is much appreciated by those who have used it for testing purposes.

It was this pamphlet, which deals with colouring matters only, that induced the author to extend it so as to be applicable to all coal-tar colours used for making lakes, as well as to the lakes themselves. The numerous reactions already observed warranted the opinion that a reliable method of testing the coal-tar colours or their lakes could be drawn up from them. The great multiplicity of the coal-tar colours in the trade—many of which are so similar that reaction characteristics are required as distinctive as those known in inorganic qualitative analysis, hitherto dispensed with—may at first sight seem to be very complicated; but the procedure is much simplified by the circumstance that we are here dealing with substances the colouring principle of which is approximately known. For instance, no one would test for a green or a blue colouring matter in a pure red or a brown-orange aniline lake; for a red or an orange colouring matter in a pure green lake pigment. There are a certain number of lakes the ground-colour of which is shaded with a coal-tar colour of a different tint (combined lakes); but in practice the analysis is generally made for the predominant colouring matter only, and the shading one afterwards determined by practical laboratory tests as known to any experienced chemist

* *The Coal-tar Colours of the Colour-works, late Meister, Lucius & Brüning.*
a. General Part, 1896.

of the branch. The essential qualification of a colour analyst is a thorough knowledge of the reactions of coal-tar colouring matters with selected specified reagents. Notwithstanding their high importance both for analysis and for technical application in the manufacture of lake pigments, the reactions of coal-tar colours have not been made the subject of a special work, although certain branches have been dealt with in books on dyeing, cloth-printing, etc.; these, however, notice the principal coal-tar colours only, and quite exceptionally their numerous lakes. The most efficient application of the coal-tar colours in lake-making necessitates, irrespective of the operative part, a special study of all the coal-tar colours employed and a very intimate knowledge of their distinctive reactions. In order to avoid undue complications, the reagents to be used should be limited in number. Apart from this, it should be carefully borne in mind that the colouring matter in this case is not present as such, but occurs in a manufactured lake in which the colouring principles have been precipitated in a special way.

The precipitation, which has a high diagnostic value in inorganic qualitative analysis with regard to the determination of the elements present, cannot be used in the same way for the coal-tar colours. For these but few methods of precipitation are used, and even then only for grouping the substances so that those having similar characters—sometimes 20, 30, or more coal-tar colours—may be precipitated by the same agent. The principal character relied on is always the visible change of shade produced by the precipitant. Apart from the analysis of the carrier of the lake in question—which is not the object of this book—this change of shade may sometimes be brought about by the decomposition of the lake, but, preferably, should be due to the alteration of the colouring matter only, in order to avoid any masking effect arising from the action on the carrier. In the following tables, caustic soda at 40° Bé. is advantageously selected as a reagent; its strength is such that it has little or no effect on the base, although it has a characteristic one on the colouring matter only. Weak caustic soda has another effect: sometimes the colouring principle is dissolved by it and the base more or less decomposed. In this case the reactions are less characteristic, and are consequently of less diagnostic value; but such reactions are retained, as they afford a good idea of the fastness of the lakes to freshly slaked lime, which is about the same as that to dilute caustic soda (12° Bé.).

A further and most important diagnostic method with regard to the nature of coal-tar colours is afforded by strong sulphuric acid, which modifies the shade of nearly all coal-tar colours in a characteristic manner, but usually it also acts on the base. The change of the shade is, however, generally so different from the original one that the action on the base does not impair the utility of this test.

In the following tables the effect of the treatment with sulphuric acid (66° Bé.) is considered in three distinct stages.

The *first* stage (Op. I.) records the results produced by sulphuric acid (66° Bé.) highly diluted by adding some drops of it to a test-glass containing about 500 c.c. of cold water. The results vary with the nature of the colouring matter used in the following ways:—

1. The original shade returns, and
 - (a) remains constant; or
 - (b) disappears after a definite interval of time.
2. A different shade from the original is produced, and
 - (a) remains constant; or
 - (b) disappears after a definite interval.
3. The lake is decolorised immediately, and
 - (a) so remains; or
 - (b) after standing a long time a pale hue similar to the original shade reappears.
4. A precipitate is produced
 - (a) of a shade similar to the original; or
 - (b) different from it; which
 - (c) remains constant; or
 - (d) disappears after a time;

and the supernatant (top) liquid is

- (a) clear and transparent;
- (b) turbid;
- (c) coloured; or
- (d) colourless.

All these characters are met with in the coal-tar colours, and are sufficiently distinct for their diagnosis.

In the *second* stage (Op. II.) the acidified liquid from Op. I. is neutralised, or rendered slightly alkaline, by means of caustic soda (12° Bé.). It is thereby rendered

1. Clear and transparent, or a precipitate is formed
 - (a) of the original shade; or
 - (b) of a different one.
2. If the precipitate persists, the supernatant (top) liquid is
 - (a) coloured; or
 - (b) colourless.

The purpose of the *third* operation (Op. III.) is to indicate if the colouring matter in question is taken up by ether or not. The

liquid from the second stage (with or without the precipitate) is first cooled down if necessary, and then strongly shaken with a suitable quantity of ether (3 to 4 c.c.). After a definite interval the ether rises to the surface, and is either coloured or colourless. In the following tables (Op. III.) only the coloration of the ether is mentioned, other remarks being avoided in order to prevent any misunderstanding. If, therefore, under Op. III. "pale lemon-yellow" is mentioned, it means that the colouring matter being tested for tints the layer of ether that shade.

The reaction of the coal-tar colour lakes with hydrochloric acid and a solution of tin salt is also of great importance, even if some colouring matters require a long time for the reaction to be completed. By the reducing effect of the tin solution (composed of 95 grms. of crystallised tin salt and 15 to 20 grms. of hydrochloric acid, 23° Bé., in 500 c.c. of water), the lakes from coal-tar colours are, with few exceptions, completely decolorised, but the time required ranges from minutes to hours or even weeks. The great difference in the time range is a very useful guide to the nature of the colouring matter being tested, as indicated by the following example.

The yellow coal-tar colours Sulfon-yellow R. conc. (Bayer), Milling-yellow OO (Casella), Citronin A (Leonhardt), and Mikado-yellow 8 G produce four lakes of exactly the same shade on a white carrier obtained by precipitation in corresponding quantities of raw materials, but very difficult to distinguish by ordinary methods, even in the hands of experienced chemists, so far as single-coloured lakes are concerned. Their characteristic reactions with the tin salt solution, however, easily differentiates them as shown below.

The lake from Sulfon-yellow R is rendered decidedly redder, and absolutely decolorised in 3 hours; the residue is white, and the supernatant (top) liquid colourless.

The lake from Milling-yellow OO turns a dirty pink shade at first; this changes to a brownish red, and the colour disappears in 4 hours; the residue is white, and the supernatant (top) liquid colourless.

The lake from Citronin A does not change its shade, but the colour disappears in 48 hours.

The lake from Mikado 8 G becomes much browner, and the colour disappears in 21 days; the residue becomes pale ochreish in colour, and the supernatant (top) liquid a pale wine-yellow.

The difference in time required for the entire loss of colour suffices for their distinction, irrespective of the change of shade; even if the percentage proportion of the first named is much higher than that of the Citronin and Mikado-yellow, the loss of colour might take 4, 6, or 8 hours, but never 48 hours or 21 days.

As a fact, the time required for complete decolorisation depends on a variety of conditions, such as, first, the weight of the lake in question, and the volume of the tin solution used; others are the percentage

of the colouring matter in the lake, the sp. gr. of the lake, the state of the lake according as it is in powder or lumps, the condition and strength of the tin solution, the temperature applied on testing, etc. In the following tables all particulars are for the 5 per cent. precipitations, *i.e.*, 100 parts of the lake contain 5 parts of colouring matter; for example, 0.25 gm. of the Sulfon-yellow lake is treated in the cold, and 5 c.c. of the tin salt solution, having the composition and strength mentioned above, until the colour disappears or remains constant. Numerous experiments proved that the time was constant under the same conditions: *i.e.*, 0.25 gm. of the lake with Sulfon-yellow was decolorised by 5 c.c. of the salt solution in 3 hours; 0.5 gm. in 6 hours; 0.75 gm. in 9 hours; and so on. The same is also true if 5, 10, or 20 per cent. precipitates are treated with the same volume (5 c.c.) of the tin salt solution. On the other hand, the colour always disappears in 3 hours if, for instance, 0.5 gm. (5 per cent.) of Sulfon-yellow lake is treated with 10 c.c. of the tin salt solution; or 0.75 gm. (5 per cent.) of the lake with 15 c.c. of the tin salt solution; or 0.25 gm. (10 per cent.) of the lake with 10 c.c. of the tin salt solution; or 0.25 gm. (20 per cent.) of the lake with 20 c.c. of the tin salt solution; all being carried out in the cold.

These examples indicate the possibility of effecting the complete loss of colour in the same time by adjusting the volume of the salt used to the ascertained percentage of colouring matter in the lake, so that, by means of the table showing the time required for decolorising the lakes with stated percentages of colouring matter, the time observed was sufficient for determining the colouring matter in the sample being tested, provided the percentage of colouring matter in it is known; while from this the quantities of the solutions required may be roughly calculated. There should also be a preliminary test for intensity of the lake in question, which need not be specially difficult in practice. The author has often been able to determine a colour in this way; doubts only exist when two or more coal-tar colouring matters differing much in their behaviour with the tin salt solution occur in the same lake, which, fortunately, is not often the case. Combined lakes containing both acid and basic coal-tar colouring matters may often be diagnosed by this method, since the constituent colours naturally differ in the time needed for decolorisation. In any case, the behaviour of aniline lakes towards a tin salt solution is always worth consideration. The additional reactions noticed in the tables are the solubility of the lake in

1. Hot water (60°–70° C.) (fastness to water),
2. Alcohol (fastness to spirit),
3. Acetic acid,
4. Oil of turpentine,
5. Linseed-oil varnish,

as also the behaviour of the lakes towards sunshine (fastness to light).

These properties of lakes are always of practical importance, but in this volume are used for diagnostic purposes only, and may successfully be applied, especially in dubious cases. As regards the behaviour of lakes towards sunshine, the percentage of colouring matter has an influence, inasmuch as those with the smaller percentages lose colour more quickly than those in which it is high. Hence the relations given in the tables are—the observed lakes being all of about the same strength—of general comparative value only. For exposure to sunshine, the lakes were mixed with size.

REACTIONS OF

A. YELLOW AND

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Quinolin-yellow	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Canary-yellow	Slight	Slight	Fair (sulphur-yellow)	Traces	Traces
Pigment-chlorin GG in pulp (M. L. Br.)	Barytes	None	Pale lemon-yellow	Insol.	Traces	Traces	Insol.	Insol.
Auramine O	China-clay	None	Lemon-yellow	Fair	Easy	Easy	Traces	Traces
Citronin (Mühl.)	Barytes	Barium chloride	Reddish lemon-yellow	Fair	Slight	Slight	Insol.	Insol.
Thioflavine T (Cass.)	Barytes	Tannin	Brownish lemon-yellow	Fair	Easy	Easy. Solution becomes turbid on standing	Traces	Fair
Milling-yellow OO (Cass.)	Barytes	Barium chloride	Reddish lemon-yellow	Insol.	Slight	Traces	Some-what	Traces

ANILINE LAKES.

BROWN LAKES.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Becomes pale orange-red. Top liquid : yellowish orange	Becomes redder after long standing, leather-coloured. Top liq. : colourless	<i>Brownish orange.</i> Op. I. : Yellowish colour Op. II. : Original colour Op. III. : Colourless	The colouring matter dissolves without change of shade. Residue : white	After 33 hours : almost decolorised (very pale yellowish)	5 per cent. precipitation.
No change	No remarkable change	First <i>bluish pink</i> , afterwards <i>yellowish</i> . Op. I. : Colourless Op. II. : Pale yellow Op. III. : The ether takes up entirely the colouring matter Residue : white	After 1 hour : completely decolorised. Top liq. : pale yellow Res. : white	After 200 hours : pale ochreish colour (nearly colourless)	5 per cent. precipitation.
Ochreish colour on standing	First, no change ; later, ochre-like colour. Top liq. : colourless	<i>Ochreish colour.</i> Op. I. : First yellowish, later colourless Op. II. : Pale sulphur-yellow Op. III. : Colourless	At first, ochreish colour. Top liq. : lemon-yellow. After 5 hours : completely decolorised. Res. : white	After 100 hours : almost decolorised (pale yellowish colour)	1 per cent. precipitation.
Becomes more yellowish. Top liq. : bright brown-red	Orange-red. Top liq. : deep brown-red	<i>Straw-yellow colour.</i> Op. I. : Colourless Op. II. : Yellow, turbid Op. III. : Colourless	After 48 hours : completely decolorised. Top liq. : yellowish. Res. : white	After 160 hours : somewhat brighter and browner	5 per cent. precipitation.
Pale lemon solut., becomes ponceau-coloured in the air, later red-brown	Rapidly decolorised ; solution turbid, grey ; becomes ponceau-coloured in the air	<i>Dirty grey.</i> Op. I. : Wine-colour, constant Op. II. : Reddish yellow Op. III. : Colourless	Orange-red, constant. Top liq. : colourless, clear	After 20 hours : decolorised	The alkaline solution gradually becomes a lively scarlet colour when standing in the air.
Somewhat redder. Top liq. : pale golden-yellow	No remarkable change	<i>Bright orange-red.</i> Op. I. : Golden-yellow colour, constant Op. II. : Original colour Op. III. : Colourless	Dirty dark pink ; later on, brown-red. After 4 hours : completely decolorised. Top liq. : colourless. Res. : white	After 100 hours : pale brownish yellow	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Mikado golden-yellow 8 G (Mühl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish lemon-yellow	Fair	Insol.	Somewhat	Insol.	Insol.
Mikado golden-yellow 6 G (Mühl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish lemon-yellow	Very slight	Insol.	Somewhat	Insol.	Insol.
Mikado golden-yellow 4 G (Mühl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark lemon-yellow	Fair	Insol.	Somewhat	Insol.	Insol.
Mikado golden-yellow 2 G (Mühl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark reddish lemon-yellow	Slight	Insol.	Traces	Insol.	Insol.
Mikado yellow G (Mühl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright yellow-orange	Insol.	Insol.	Insol.	Insol.	Traces
Chloramine-yellow GG (Bay.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish lemon-yellow	Traces	Traces (sulphur-yellow)	Fair. Solution : pale lemon-yellow	Fair	Traces
Chloramine-yellow M (Bay.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brownish lemon-yellow	Easy	Easy (golden-yellow)	Easy. Solution : brownish golden-yellow	Traces	Fair

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Greenish brown. Top liq.: brilliant blood-red	Greenish brown. Top liq.: blood-red	<i>Brilliant blood-red.</i> Op. I.: Sulphur-yellow, constant Op. II.: Original colour Op. III.: Colourless	Becomes browner. After 21 days: completely decolorised. Top liq.: wine-yellow. Res.: ochreish-coloured	After 100 hours: colour pale ochreish (reddish)	5 per cent. precipitation.
Reddish brown. Top liq.: bright ponceau	Yellowish brown. Top liq.: brownish red	<i>Yellowish ponceau.</i> Op. I.: Golden-yellow, constant Op. II.: Yellowish orange Op. III.: Colourless	Browner. Top liq.: colourless. After 21 days: completely decolorised. Top liq.: colourless. Res.: white	After 100 hours: nearly colourless (pale reddish yellow, ochre-like)	5 per cent. precipitation.
Becomes brownish. Top liq.: reddish yellow	Becomes reddish brown. Top liq.: bluish orange	<i>Reddish ponceau.</i> Op. I.: Golden-yellow, constant Op. II.: Solution becomes more brownish Op. III.: Colourless	Decidedly brown. After 21 days: completely decolorised. Top liq.: colourless. Res.: pale ochre-coloured	After 100 hours: decidedly brown, but not brighter	5 per cent. precipitation.
Slightly redder. Top liq.: reddish yellow	Becomes reddish brown. Top liq.: lively yellowish orange	<i>Yellowish ponceau.</i> Op. I.: Brownish orange-yellow, constant Op. II.: Original colour Op. III.: Colourless	Red-brown. Top liq.: colourless. After 21 days: completely decolorised. Top liq.: colourless. Res.: yellowish white	After 100 hours: ochreish in colour (reddish)	5 per cent. precipitation.
Redder. Top liq.: pale golden-yellow	Brown-orange. Top liq.: pale reddish yellow	<i>Brown-red.</i> Op. I.: Reddish yellow, constant Op. II.: Brownish orange Op. III.: Colourless	Decidedly brown. Top liq.: colourless. After 21 days: completely decolorised. Top liq.: colourless. Res.: nearly white	After 100 hours: colour ochreish (yellowish)	5 per cent. precipitation.
More reddish. Top liq.: bright golden-yellow, clear	Browner. Top liq.: colourless	<i>Brilliant ponceau.</i> Op. I.: Lemon-yellow, constant Op. II.: Turbid (vegetable-yellow) Op. III.: Colourless	Becomes sulphur-yellow. Top liq.: pale yellow. After 10 hours: decolorised. Top liq.: colourless. Res.: white	After 200 hours: bright ochreish-coloured	5 per cent. precipitation.
Browner. Top liq.: brilliant golden-yellow	Browner. Top liq.: colourless	<i>Brilliant purple-red.</i> Op. I.: Wine-yellow, constant Op. II.: Through greenish black to ochreish Op. III.: Colourless	Umber-coloured (greenish brown). Top liq.: colourless. After 5 weeks: Res.: ochre-coloured. Top liq.: pale yellowish	After 100 hours: almost decolorised (pale yellowish)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Direct yellow R (Bay.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Deep brownish orange	Some-what	Traces	Easy. Solution : golden-yellow	Traces	Traces
Fast light yellow G (Bay.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright lemon-yellow	Easy	Easy (lemon-yellow)	Easy (pale lemon-yellow)	Fair	Fair
Paper-yellow GG (Bay.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish dark lemon-yellow	Easy	Fair (wine-yellow)	Easy. Solution : lemon-yellow	Traces	Fair
Paper-yellow R (Bay.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brownish orange	Easy	Traces	Easy (pale lemon-yellow)	Traces	Fair
Sulfon-yellow R conc. (Bay.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Deep golden-yellow	Easy	Easy (lemon-yellow)	Easy. Solution : reddish golden-yellow	Fair	Fair
Indian-yellow R (Bay.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brownish lemon-yellow	Easy	Easy (dark lemon)	Easy. Solution : deep yellow-red	Fair	Fair

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Browner. Top liq.; brilliant reddish orange	Bright brown-red. Top liq.: brownish yellow	<i>Brilliant brown-red.</i> Op. I.: Brownish golden-yellow Op. II.: Orange red Op. III.: Colourless	Red-brown. Top liq.: colourless. After 60 hours: decolorised. Top liq.: colour- less. Res.: pale flesh-coloured	After 150 hours: considerably paler, dirty reddish (nearly brick-red)	5 per cent. precipitation.
Becomes brighter. Top liq.: lemon-yellow	Colour retained. Top liq.: lemon-yellow	<i>Scarcely appreciably brownier.</i> Op. I.: Sulphur- yellow, constant Op. II.: Canary- yellow, turbid Op. III.: Pale lemon- yellow	After 3 hours: decolorised. Top liq.: colourless. Res.: white	After 80 hours: very bright ochre	5 per cent. precipitation.
Becomes some- what browner. Top liq.: brilli- ant yellowish yellow	Red-brown. Top liq.: almost colourless	<i>Brilliant blood-red.</i> Op. I.: Sulphur- yellow, constant Op. II.: Reddish orange Op. III.: Colourless	Greenish olive. Top liq.: bright yellow. After 48 hours: decolorised. Top liq.: pale yellow. Res.: yellowish white	After 200 hours: considerably brighter, reddish brown	5 per cent. precipitation.
Decidedly redder. Top liq.: brilliant reddish orange	Brilliant brown-red. Top liq.: brownish yellow	<i>Brilliant cherry-red.</i> Op. I.: Bright lemon- yellow, constant Op. II.: Red-brown Op. III.: Colourless	Chocolate-brown. Top liq.: colourless. After 60 hours: decolorised. Top liq.: pale yellow: Res.: yellowish white	After 200 hours: considerably brighter and brownier	5 per cent. precipitation.
Becomes brighter. Top liq.: lively orange	No change of colour. Top liq.: brilliant lemon-yellow	<i>Lively golden-yellow.</i> Op. I.: Sulphur- yellow, constant Op. II.: Bright lemon Op. III.: Colourless	Rather redder. After 3 hours: decolorised. Top liq.: colourless: Res.: white	After 80 hours: bright ochre- coloured	5 per cent. precipitation.
Tobacco-brown. Top liq.: brownish	At first, dark brown (nearly black), later brighter. Top liq.: colourless	<i>Red-violet.</i> Op. I.: Golden-yellow, constant (turbid) Op. II.: Leather- coloured Op. III.: Brilliant lemon-yellow	At first, ochre- colour. Top liq.: brilliant yellow-red. After 72 hours: decolorised. Top liq.: pale brownish yellow. Res.: yellowish white	After 200 hours: brownish ochre- coloured (bright)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Chrysophenin G (Bay.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brownish golden-yellow	Easy	Easy (bright lemon-yellow)	Becomes brighter. Traces (sulphur-yellow)	Fair	Fair
Mordant-yellow G (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	greenish lemon-yellow	Fair	Traces	At first, dirty red-brown; later, yellowish. Solution: orange	Insol.	Insol.
Mordant-yellow R (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brownish yellow	Fair	Traces	Becomes dirty and brighter. Solution: bright orange	Somewhat	Traces
Naphthol-yellow S	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright lemon-yellow	Fair	Fair (bright yellow)	Fair (bright lemon-yellow)	Insol.	Traces
Paper-yellow A (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright yellowish brown	Very easy	Fair (golden-yellow)	Easy; changes to leather-colour. Solution: greenish yellow	Insol.	Traces
Paper-yellow 3 G (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright brownish lemon-yellow	Slight	Fair (golden-yellow)	Slight; becomes greener. Sol.: bright yellow	Very easy	Traces

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl.		
Becomes somewhat redder. Top liq.: nearly colourless	Orange-red. Top liq.: colourless	<i>Red-violet.</i> Op. I.: Dirty green precipitate, liquid yellow, constant Op. II.: Orange Op. III.: Colourless	At first, bluish bole-like coloured. After a short time: decolorised. Top liq.: colourless. Res.: white	After 150 hours: dirty greenish yellow	5 per cent. precipitation.
Fairly soluble lake. Top liq.: yellowish orange	Deep brownish orange. Top liq.: bright ponceau	<i>Fiery bright ponceau.</i> Op. I.: Sulphur-yellow, constant Op. II.: Bright reddish grey Op. III.: Pale sulphur-yellow	Crimson-red. After 1 hour: decolorised. Res.: white. Top liq.: colourless	After 150 hours: brownish ochre-coloured (dark)	5 per cent. precipitation.
Fairly soluble; becomes reddish orange. Top liq.: yellowish red.	Deep brownish red. Top liq.: dark golden-yellow	<i>Brilliant cherry-red.</i> Op. I.: Sulphur-yellow, constant Op. II.: Pale yellow-grey Op. III.: Brownish golden-yellow	Chocolate-brown, rapidly decolorised. Top liq.: colourless. Res.: white	After 150 hours: very much browner	5 per cent. precipitation.
Fairly soluble. Top liq.: deep golden-yellow	Somewhat browner. Top liq.: brownish yellow	<i>Pale straw-yellow.</i> Op. I.: Pale yellow, constant Op. II.: Original colour Op. III.: Colourless	Sulphur-yellow. Top liq.: on standing a short time, gelatinous, and later liquefies. After 5 hours: decolorised. Top liq.: pale yellow. Res.: white	After 200 hours: considerably brighter and browner	5 per cent. precipitation.
Lively ponceau-red. Top liq.: ponceau-red	Scarlet-red. Top liq.: ruby-red	<i>Red-violet.</i> Op. I.: Wine-yellow, constant Op. II.: Original colour Op. III.: Colourless	Reddish grey. After 1 hour: completely decolorised. Top liq.: colourless. Res.: pale reddish	After 150 hours: brownish pink	5 per cent. precipitation.
No marked change	Somewhat browner. Top liq.: colourless	<i>Red-violet.</i> Op. I.: Greenish yellow Op. II.: Original colour Op. III.: Colourless	Deep reddish grey, then red-brown. After 1 hour: completely decolorised. Top liq.: colourless. Res.: pale yellowish white	After 120 hours: ochre-coloured	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Paper-yellow RR (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Deep brownish yellow (with red tinge)	Easy	Easy ; yellow-orange	Becomes brick-red ; fair (reddish orange)	Fair	Great
Pyramine-yellow G, for lakes (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Deep lemon-yellow	Easy	Fair (golden-yellow)	Slight ; becomes leather-yellow. Sup. liq. : wine-yellow	Fair	Somewhat
Metanil-yellow PL (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish lemon-yellow with brownish tinge	Easy	Easy (reddish lemon-yellow)	Easy ; lake becomes tobacco-brown. Top liq. : ponceau-red	Somewhat	Fair
Metanil-yellow extra (Berl.)	Barytes	Barium chloride	Brownish lemon-yellow	Easy	Easy (dark lemon-yellow)	Easy ; lake becomes bright brown. Top liq. : ponceau-red	Somewhat	Fair
Metanil-yellow extra conc. 4347 S.V. (W. ter Meer)	Barytes	Barium chloride	Brownish lemon-yellow	Fair	Easy	Easy ; lake becomes tobacco-brown. Sol. : ponceau-red	Traces	Somewhat
Metanil-yellow 26060 I. (W. ter Meer)	Barytes	Barium chloride	Brownish lemon-yellow	Fair	Fair	Easy ; lake becomes tobacco-brown. Sol. : ponceau-red	Insol.	Somewhat

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Brownish leather-coloured. Top liq. : brilliant brownish red	Deep brown, almost black. Top liq. : colourless	<i>Very bright red-violet.</i> Op. I. : Brownish yellow, constant Op. II. : Original colour Op. III. : Sulphur-yellow	Brilliant yellow-brown. Top liq. : golden-yellow. After 30 days, top liq. : brown, clear. Res. : ochre-coloured	After 80 hours : dirty reddish brown	5 per cent. precipitation.
Colour at first unchanged, later on becomes somewhat redder. Top liq. : colourless	Somewhat redder. Top liq. : colourless	<i>Bluish violet.</i> Op. I. : Pale yellow (Res. : blue) Op. II. : Original colour Op. III. : Colourless	Pale violet. After $\frac{3}{4}$ hour : completely decolorised. Top liq. : colourless. Res. : reddish white	After 80 hours : dirty yellowish grey	5 per cent. precipitation.
Slightly sol. ; colour not changed. Top liq. : pale lemon-yellow	Becomes brighter. Top liq. : colourless	<i>Deep blue (with red tinge).</i> Op. I. : Ponceau-red, constant Op. II. : Yellowish brown Op. III. : Pale sulphur-yellow	Purple-red. Top liq. : becomes greenish. After 1 hour : completely decolorised. Res. : white. Top liq. : greenish	After 80 hours : chocolate-brown	5 per cent. precipitation.
Slightly sol., no change of colour. Top liq. : bright lemon	Becomes greenish leather-coloured. Top liq. : colourless	<i>Violet-blue.</i> Op. I. : Yellowish ponceau-red, constant Op. II. : Yellowish brown Op. III. : Pale bluish red	Purple-red. Top liq. : at first colourless, later on greenish. After 1 hour : completely decolorised. Res. : white. Top liq. : greenish	After 80 hours : chocolate-brown	5 per cent. precipitation.
No change of colour. Top liq. : pale lemon-yellow	No effect	<i>Dark bluish violet.</i> Op. I. : Brownish-red, constant Op. II. : Original shade Op. III. : Pale sulphur-yellow (nearly colourless)	Purple, becomes brighter red, and finally bluish pink. After 24 hours : entirely decolorised. Top liq. : pale yellow. Res. : white	After 80 hours : much browner	The various brands of metanil-yellow are very differently reduced by SnCl ₂ + HCl solution as regards time.
Colour somewhat brighter. Top liq. : bright lemon-yellow	No effect	<i>Dark reddish violet.</i> Op. I. : Red-brown, constant Op. II. : Original shade Op. III. : Pale lemon (nearly colourless)	Purple, becoming bluer. After 30 hours : completely decolorised. Top liq. : colourless. Res. : bluish grey	After 80 hours : much browner	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Astacin-yellow R (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brownish yellow	Easy	Slight	Fair; lake becomes somewhat redder. Top liq.: golden-yellow	Insol.	Insol.
Azo-yellow O (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brilliant bright lemon-yellow (reddish)	Easy	Easy (yellow-orange)	Fair (bright lemon)	Fair	Great
Victoria-yellow conc. (M. L. Br.)	Barytes	Barium chloride	Lemon-yellow, bright reddish tinge	Easy	Easy (yellow-orange)	Easy; lake becomes red-brown. Sol.: brilliant ponceau-red	Some-what	Fair
Citronin G ₀₀₀ (Oehler)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright lemon-yellow (reddish tinge)	Fair	Easy	Fair (pale lemon)	Fair	Great
Citronin R ₀₀ (Oehler)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish lemon-yellow with notable brownish tinge	Fair	Easy	Fair (brownish orange)	Fair	Great
Cloth-yellow G (Oehler)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Like the Schüttgelb of the Germans (yellowish olive)	Fair	Slight	Fair (wine-yellow)	Some-what	Insol.
Cloth-yellow R (Oehler)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brilliant bright lemon-yellow	Fair	Fair	Fair (wine-yellow)	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Greenish olive. Top liq. : deep greenish yellow (dissolves much colouring matter)	Bright yellow, turning greenish. Top liq. : deep green	<i>Yellowish pink.</i> Op. I. : Bright lemon-yellow Op. II. : Lively golden-yellow Op. III. : Colourless	Brick-red, then yellowish pink. Top liq. : lemon-yellow (soon sets in a jelly)	After 200 hours : dirty pale yellowish	5 per cent. precipitation.
Greenish leather-coloured. Top liq. : pale pink (dissolves a little colouring matter)	Black-brown. Top liq. : colourless	<i>Brilliant carmoisin-red.</i> Op. I. : Lively sulphur-yellow Op. II. : Brownish yellow Op. III. : Brilliant sulphur-yellow	Golden-yellow. After 30 days : Res. : ochre-coloured. Top liq. : brownish (red reflex)	After 100 hours : ochre-coloured	5 per cent. precipitation.
Slightly sol.; no change of colour. Top liq. : pale golden-yellow	Greenish leather-colour. Top liq. : colourless	<i>Dark reddish violet.</i> Op. I. : Bluish scarlet, shortly afterwards colourless Op. II. : Original colour Op. III. : Colourless	Brilliant purple-red. Top liq. : colourless. After 2½ hours : decolorised. Res. : white. Top liq. : colourless	After 80 hours : deep tobacco-brown	5 per cent. precipitation.
Yellow-brown. Top liq. : pale bluish red	Dark brown (nearly black). Top liq. : colourless	<i>Lively carmine.</i> Op. I. : Wine-yellow, constant Op. II. : Original colour Op. III. : Brilliant lemon-yellow	At first, colour unchanged. Top liq. : brilliant lemon-yellow. After 30 hours : Res. : white. Top liq. : golden-yellow, turbid	After 80 hours : ochre-coloured	After being shaken with ether, the liquid below the ether zone colourless.
Yellow-brown. Top liq. : brownish	Dark brown (umber). Top liq. : colourless	<i>Lively bluish carmine.</i> Op. I. : Lemon-yellow, constant Op. II. : Brownish yellow Op. III. : Brilliant lemon-yellow	At first, greenish brown (umber). Top liq. : lemon-yellow. After 16 days : Res. : pale ochre-colour. Top liq. : pale sulphur-yellow	After 80 hours : much browner (nut-brown)	After being shaken with ether, the liquid below the ether zone bluish pink coloured.
Becomes yellow-orange. Top liq. : yellow-red	Brownish orange. Top liq. : brilliant yellow-red	<i>Brilliant golden yellow.</i> Op. I. : Colourless Op. II. : Original colour Op. III. : Brilliant sulphur-yellow	At first unchanged, a few minutes later completely decolorised. Res. : white. Top liq. : colourless	After 150 hours : much browner	5 per cent. precipitation.
Brilliant orange-red. Top liq. : ponceau-red	Brown-red. Top liq. : pale ponceau	<i>Brilliant yellow-orange.</i> Op. I. : Traces yellow-coloured Op. II. : Pale flesh-coloured Op. III. : Brilliant sulphur-yellow	Completely decolorised after a few minutes. Res. : white. Top liq. : colourless	After 150 hours : much brighter and redder	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Pigment chrome-yellow L in pulp (M. L. Br.)	Barytes	None	Bright lemon-yellow	Insol.	Fair	No effect	Great	Fair
Paraphosphin	China-clay	None	Dead pale lemon-yellow	Insol.	Traces	No effect	Insol.	Insol.
Curcumëin GG (Beyer u. Kegel)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright lemon-yellow	Fair	Fair (sulphur-yellow)	Somewhat (sulphur-yellow)	Fair	Great
Curcumëin extra f. (Beyer u. Kegel)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Golden-yellow	Fair	Fair (lemon-yellow)	Fair (golden-yellow, reddish)	Fair	Great
Phosphine 2 G	China-clay	None	Ochreish	Insol.	Somewhat (brownish yellow)	No effect	Insol.	Insol.
Phosphine 3 R	China-clay	None	Reddish ochre	Insol.	Traces	No effect	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Somewhat redder. Top liq. : sulphur-yellow	No effect	<i>Brilliant lemon-yellow.</i> Op. I. : Sulphur-yellow Op. II. : Original colour Op. III. : Brilliant lemon-yellow	No change even after very long treatment	After 200 hours : very little change	The liquid below the ether zone is bluish pink.
No remarkable effect	No effect	<i>No change of colour.</i> Op. I. : Faintly yellowish Op. II. : ... Op. III. : Colourless	No effect	After 17 hours : nearly colourless (pale reddish grey) ; very pale	1 per cent. precipitation.
Becomes deep red-brown ; lake partly decomposed. Res. : tobacco-brown. Top liq. : ruby-red	Deep dark brown, nearly black. Top liq. : pale yellowish	<i>Brilliant carmine.</i> Op. I. : Canary-yellow, constant Op. II. : Fine brownish lemon precipitate. Top liq. : pale yellowish Op. III. : Bright sulphur-yellow	Deep chocolate-brown. After 11 days : decolorised. Res. : white. Top liq. : colourless, milky	After 50 hours : decidedly paler and browner	5 per cent. precipitation.
Becomes greenish olive, otherwise little effect. Res. : greenish olive. Top liq. : pale pink, brownish	Greenish black. Top liq. : colourless	<i>Brilliant red-violet.</i> Op. I. : Lemon-yellow, constant, clear Op. II. : Fine precipitate ; shade like the Schütt-yellow of the Germans. Top liq. : pale yellowish Op. III. : Brilliant lemon-yellow	Becomes much greener. Top liq. : lemon-yellow. After 8 days : decolorised. Res. : white. Top liq. : colourless, milky	After 50 hours : bright ochre-coloured	5 per cent. precipitation.
Becomes greenish yellow, and brighter. Top liq. : colourless	Greenish yellow, and brighter. Top liq. : colourless	<i>Pale yellowish green.</i> Op. I. : Colourless Op. II. : Original shade Op. III. : Colourless	No effect	After 70 hours : almost decolorised	The phosphine lakes treated with caustic soda only and shaken with ether have a yellow-coloured ether zone, with beautiful green fluorescence. Paraphosphine forms an exception.
Reddish grey colour, then yellower, and finally greenish grey. Top liq. : colourless	Dirty olive-green. Top liq. : colourless	<i>Dirty pale olive-green.</i> Op. I. : Colourless Op. II. : Original colour Op. III. : Colourless	No effect	After 70 hours : almost decolorised	

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Manchester-brown EE (Cassella)	China-clay	None	Reddish brown	Insol.	Easy (brown-red)	Somewhat (reddish yellow)	Insol.	Insol.
Chrysoidin O	China-clay	None	Pale brownish orange	Insol.	Easy (brownish orange)	Somewhat (wine-yellow)	Insol.	Insol.
Vesuvine 4 GB (M. L. Br.)	China-clay	None	Reddish brown	Insol.	Easy (brown-red)	Fair (brownish orange)	Insol.	Insol.
Vesuvine BL (Bad.)	China-clay	None	Reddish brown	Insol.	Easy (brown-red)	Slight (wine-yellow)	Insol.	Insol.
Bismarck-brown F (Bayer)	China-clay	None	Reddish brown	Insol.	Fair (brownish yellow)	Somewhat (lively golden-yellow)	Insol.	Insol.
Benzo-chrome-brown G (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Tobacco-brown, reddish	Insol.	Traces	Traces	Insol.	Traces

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Becomes brownish orange. Top liq.: pale lemon-yellow	Brownish orange. Top liq.: colourless	<i>Dark brown-red</i> (somewhat opalescent). Op. I.: Very faintly brown-red, then colourless Op. II.: Reddish brown (opalescent) Op. III.: Colourless	At first unchanged. After 40 hours: completely decolorised. Res.: pale flesh-coloured. Top liq.: colourless	After 100 hours: nearly colourless (pale yellowish, nearly white)	The lakes from the so-called Bismarck-brown colouring matters (Vesuvine, Manchester-brown, etc.) treated with caustic soda only give, when shaken with ether, an ether zone of a brilliant lemon yellow shade. No reaction when treated with sulphuric acid and afterwards neutralised with caustic soda.
Becomes much yellower. After 1 hour: decolorised. Res.: pale ochre-coloured. Top liq.: pale sulphur-yellow	Yellower. Top liq.: colourless	<i>Brown-red.</i> Op. I.: Colourless Op. II.: At first carmoisin-red, then original colour Op. III.: Colourless	At first, somewhat browner. After 40 hours: completely decolorised. Res.: dirty bluish pink (very clear). Top liq.: colourless	After 100 hours: almost decolorised (dirty brownish pink)	
Becomes brownish orange, and brighter. Top liq.: pale lemon-yellow	Brownish orange. Top liq.: colourless	<i>Dark brown-red</i> (opalescent). Op. I.: Faintly brownish yellow, later colourless Op. II.: Original colour Op. III.: Colourless	After 40 hours: completely decolorised. Res.: yellowish white. Top liq.: colourless	After 70 hours: almost colourless (pale reddish grey)	
Becomes yellow-brown, and brighter. Top liq.: lemon-yellow	Yellow-brown. Top liq.: colourless	<i>Dirty brown-red.</i> Op. I.: Colourless Op. II.: Dirty yellowish brown Op. III.: Colourless	After 40 hours: completely decolorised. Res.: yellowish white. Top liq.: colourless	After 70 hours: almost colourless (pale reddish grey)	
Becomes dark lemon-yellow. Top liq.: lemon-yellow	Reddish golden-yellow. Top liq.: colourless	<i>Dirty brown-red.</i> Op. I.: Colourless Op. II.: Dirty yellow-brown Op. III.: Colourless	After 36 hours: decolorised. Res.: pale yellowish white. Top liq.: colourless	After 70 hours: nearly colourless (pale reddish grey)	1 per cent. precipitation
At first unchanged, later partly decomposed. Res.: red-brown. Top liq.: brownish orange	Brilliant red-brown. Top liq.: colourless	<i>Indigo-blue with green tinge.</i> Op. I.: Yellow brown, cheesy precipitate insol. in water Op. II.: Deep tobacco-brown, dense precipitate. Top liq.: colourless Op. III.: Brownish yellow	Greenish umber-coloured. After 9 days: decolorised. Res.: pale flesh-colour. Top liq.: pale pink, milky	In 50 hours: much lighter and yellower	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Benzo-chrome-brown R (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Red-brown	Insol.	Traces	Traces	Insol.	Traces
Chloramine-brown G (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Red-brown	Insol.	Traces	Traces	Insol.	Insol.
Fast brown GR (Berlin)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively reddish brown	Fair	Fair (reddish brown)	Fair (reddish brown)	Insol.	Somewhat

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Becomes somewhat redder, then partly decomposed. Res. : red-brown. Top liq. : brownish orange	Brilliant red-brown. Top liq. : colourless	<i>Indigo-blue with red tinge.</i> Op. I. : Red-brown, cheesy precipitate insol. in water Op. II. : Dark brown, denser precipitate. Top liq. : colourless Op. III. : Colourless	At first, no change. Top liq. : yellowish. After 8 days : decolorised. Res. : bright reddish grey. Top liq. : pale yellowish white, milky	In 50 hours : much brighter and yellower	5 per cent. precipitation.
No effect	Brilliant red-brown. Top liq. : colourless	<i>Brilliant dark green.</i> Op. I. : Very fine brown-red precipitate insol. in water Op. II. : Dense red-brown precipitate. Top liq. : colourless Op. III. : Colourless.	At first, dark chocolate-brown. Top liq. : sulphur-yellow. After 14 days : decolorised. Res. : nearly white. Top liq. : sulphur-yellow, milky	In 50 hours : much paler	5 per cent. precipitation.
Much redder ; lake partly decomposed. Res. : dark brown. Top liq. : ruby-red	Brilliant red-brown. Top liq. : pale reddish	<i>Dark violet-red.</i> Op. I. : Pale red-brown, constant Op. II. : Fine bright red-brown precipitate. Top liq. : colourless Op. III. : Brilliant golden-yellow	At first, unchanged. After 8 days : decolorised. Res. : very pale bluish grey. Top liq. : colourless, milky	In 36 hours : pale brownish grey ; nearly white	5 per cent. precipitation.

B. ORANGE

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Orange II. 35462 (W. ter Meer)	Barytes	Barium chloride	Yellow-orange	Easy	Fair	Easy	Insol.	Insol.
Orange II. extra conc. 52 SE. (W. ter Meer)	Barytes	Barium chloride	Very yellowish orange	Easy	Fair	Easy	Insol.	Insol.
Orange G extra (Beyer u. Kegel)	Barytes	Barium chloride	Very yellowish orange	Easy	Fair	Great	Insol.	Insol.
Orange RL (Beyer u. Kegel)	Barytes	Barium chloride	Yellowish orange.	Easy	Fair	Great	Insol.	Insol.
Orange extra (Cassella)	Barytes	Barium chloride	Yellowish orange	Easy	Fair	Great	Traces	Insol.

LAKES.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Colouring matter completely dissolved. Res. : white. Top liq. : yellowish ponceau	Bright yellowish carmine. Top liq. : colourless	<i>Beautiful bright carmine.</i> Op. I. : Reddish golden-yellow, constant Op. II. : Brick-red, fine precipitate. Top liq. : colourless. Op. III. : Brilliant lemon-yellow	After 1 hour : completely decolorised. Res. : white. Top liq. : colourless (milky)	After 200 hours : brownish ochre	5 per cent. precipitation.
Colouring matter completely dissolved. Res. : white. Top liq. : reddish ponceau	Carmine. Top liq. : colourless	<i>Beautiful bluish carmine.</i> Op. I. : Golden-yellow, constant Op. II. : Dirty brown, flocculent precipitate. Top liq. : pale yellowish Op. III. : Brilliant golden-yellow	After 1½ hour : completely decolorised. Res. : white. Top liq. : colourless	After 200 hours : pale brownish (very light in shade)	5 per cent. precipitation.
Complete solution of colour. Res. : white. Top liq. : brownish ponceau	Bluish carmine. Top liq. : colourless	<i>Beautiful bluish carmine.</i> Op. I. : Golden-yellow, constant Op. II. : Pale brownish red precipitate. Top liq. : pale bluish red. Op. III. : Brilliant golden-yellow	In 30 minutes : completely decolorised. Res. : white. Top liq. : colourless (milky)	After 200 hours : dull brownish ochre-coloured	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : yellowish ponceau	Dirty yellow-brown	<i>Lively carmoisin-red.</i> Op. I. : Reddish yellow, constant Op. II. : Reddish yellow, voluminous precipitate. Top liq. : colourless. Op. III. : Brilliant golden-yellow	After 10 hours : completely decolorised. Res. : white. Top liq. : colourless (milky)	After 100 hours : nearly completely decolorised (pale brownish)	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : reddish ponceau	Bluish carmine. Top liq. : colourless	<i>Lively light carmine.</i> Op. I. : Golden-yellow, constant Op. II. : Voluminous orange-yellow precipitate Op. III. : Golden-yellow	After 1½ hour : completely decolorised. Res. : white. Top liq. : colourless (milky)	After 200 hours : dirty bluish pink	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Orange ENL (Cassella)	Barytes	Barium chloride	Very bright reddish orange	Easy	Fair	Great	Insol.	Insol.
Orange II (Cassella)	Barytes	Barium chloride	Yellowish orange	Easy	Fair	Great	Traces	Insol.
Orange A (Mühl.)	Barytes	Barium chloride	Pale yellowish orange	Easy	Fair	Easy	Insol.	Insol.
Orange II L (M. L. Br.)	Barytes	Barium chloride	Yellowish orange	Fair	Fair	Fair	Insol.	Insol.
Orange II R (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively reddish orange	Easy	Fair	Easy	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Complete solution. Res. : white. Top liq. : yellowish ponceau	No effect	<i>Full orange-red.</i> Op. I. : Pale golden-yellow, constant Op. II. : Dense precipitate, shade : like colcothar. Top liq. : colourless Op. III. : Brownish yellow	In 2 hours : completely decolorised. Res. : white. Top liq. : colourless (milky)	After 120 hours : dirty bluish pink	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : reddish ponceau	Brownish carmine. Top liq. : pale yellowish	<i>Bright bluish carmine.</i> Op. I. : Golden-yellow, constant Op. II. : Dense brownish orange-red precipitate. Top liq. : colourless Op. III. : Bright golden-yellow	In 1 hour : completely decolorised. Res. : white. Top liq. : colourless (milky)	After 150 hours almost decolorised (pale yellowish pink)	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : reddish ponceau	Lively bluish carmine. Top liq. : colourless	<i>Bluish carmine.</i> Op. I. : Golden-yellow, constant Op. II. : Pale yellowish orange-red precipitate. Top liq. : colourless Op. III. : Golden-yellow	In 2 hours : completely decolorised. Res. : white. Top liq. : colourless (milky)	After 200 hours : almost decolorised (pale yellowish pink)	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : brownish ponceau	Lively carmine. Top liq. : colourless	<i>Reddish carmoisin.</i> Op. I. : Reddish golden-yellow, constant Op. II. : Leather-coloured, flocculent precipitate. Top liq. : colourless Op. III. : Golden-yellow	In less than 30 minutes completely decolorised. Res. : white. Top liq. : colourless (milky)	After 200 hours : almost decolorised (pale yellowish pink)	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : brilliant ponceau	Bright bluish carmine. Top liq. : colourless	<i>Light carmine.</i> Op. I. : Yellowish red, constant Op. II. : Brownish orange, finely flocculent precipitate. Top liq. : bluish pink Op. III. : Bright golden-yellow	After 19 hours : completely decolorised. Res. : white. Top liq. : colourless (milky)	After 80 hours : almost decolorised (pale bluish pink)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Fast Orange O (M. L. Br.)	Barytes	Barium chloride	Yellowish orange	Fair	Fair	Somewhat	Insol.	Insol.
Brilliant Orange G (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very lively yellowish orange	Fair	Fair	Fair	Insol.	Traces
Brilliant Orange R (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Beautiful reddish orange (very brilliant)	Fair	Fair	Fair	Traces	Somewhat
Orange for lakes ON (Bad.)	Barytes	Barium chloride	Rather lively reddish orange	Slight	Fair	Fair	Somewhat	Traces

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Incomplete solution. Res. : bright red-brown, later yellowish. Top liq. : brown-red (opaque)	Deep chocolate-brown. Top liq. : colourless	<i>Brilliant bluish Bordeaux</i> (crimson). Op. I. : Flocculent, yellowish orange precipitate. Top liq. : reddish orange Op. II. : Finely flocculent, brick-red precipitate. Top liq. : colourless Op. III. : Brilliant lemon-yellow	At first, no change. Top liq. : sulphur-yellow. After 2 hours : completely decolorised. Res. : white. Top liq. : sulphur-yellow (opaque)	After 200 hours : very little changed (scarcely appreciably clearer)	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : yellowish red, clear	Lively scarlet. Top liq. : pale yellow	<i>Yellowish ponceau</i> . Op. I. : Wine-yellow, constant Op. II. : Reddish orange, finely flocculent precipitate. Top liq. : reddish yellow Op. III. : Brilliant clear lemon-yellow	After 25 hours : decolorised. Res. : white. Top liq. : colourless (milky)	After 100 hours : nearly decolorised (pale bluish pink)	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : yellowish red, clear	Rather more reddish. Top liq. : pale yellow	<i>Reddish ponceau</i> . Op. I. : Faint reddish orange, constant Op. II. : Dark ponceau, heavy precipitate. Top liq. : yellowish, with pink tinge Op. III. : Brownish yellow	At first unchanged, then gradually becomes pink. After 4½ days : completely decolorised. Res. : white. Top liq. : colourless (milky)	After 60 hours : nearly decolorised (faint bluish pink)	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : yellowish red, clear	No effect	<i>Bright brownish orange</i> . Op. I. : Nearly colourless (pink tinge) Op. II. : Dense brownish orange-red precipitate. Top liq. : colourless Op. III. : Pale lemon-yellow	After 28 hours : completely decolorised. Res. : white. Top liq. : colourless (milky)	After 60 hours : nearly decolorised (pale yellowish pink)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Orange A extra (Bad.)	Barytes	Barium chloride	Lively reddish orange	Fair	Great	Fair	Great	Great
Orange II L (Bad.)	Barytes	Barium chloride	Yellowish orange	Fair	Easy	Easy	Insol.	Insol.
Mandarin G extra (Berl.)	Barytes	Barium chloride	Yellowish orange	Some-what	Fair	Fair	Insol.	Insol.
Mandarin RL (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very bright reddish orange	Fair	Fair	Fair	Insol.	Traces
Chloramine-orange G (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark brownish orange	Some-what	Fair	Slight; the lake becomes much browner. Top. liq.: reddish yellow	Insol.	Insol.

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.	In Direct Sunlight.	Special Remarks.
Complete solution. Res. : white. Top liq. : yellow-red, clear	Brilliant scarlet. Top liq. : colourless	<i>Deep ponceau.</i> Op. I. : Pale yellow (pink tinge) Op. II. : Dense bright ponceau precipitate. Top liq. : nearly colourless (pink tinge) Op. III. : Brownish golden yellow	In 5½ days : decolorised. Res. : white. Top liq. : pale pink (opaque)	After 60 hours : almost decolorised (pale pink)	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : red-brown, turbid	Carmine. Top liq. : colourless	<i>Brilliant carmine.</i> Op. I. : Bright lemon-yellow, constant Op. II. : Dirty yellow-red precipitate Op. III. : Brilliant pale lemon-yellow	After 2 hours : decolorised. Res. : white. Top liq. : colourless (milky)	After 150 hours : dull pink	5 per cent. precipitation
Incomplete solution. Res. : brownish red. Top liq. : red-brown.	Brownish carmine. Top liq. : colourless	<i>Bright bluish carmine.</i> Op. I. : Bright golden-yellow, constant Op. II. : Dirty brownish yellow precipitate. Top liq. : pale reddish yellow Op. III. : Brilliant lemon-yellow	Becomes somewhat browner. After 3 hours : decolorised. Res. : white. Top liq. : colourless (milky)	After 150 hours : dull pink	5 per cent. precipitation.
Incomplete solution. Res. : brick-red. Top liq. : brownish-red	Brilliant ponceau. Top liq. : colourless	<i>Very lively light carmine.</i> Op. I. : Golden-yellow, constant Op. II. : Brilliant vermilion flocculent precipitate. Top liq. : golden yellow Op. III. : Brilliant lemon-yellow	Becomes much redder. In 31 hours : completely decolorised. Res. : white. Top liq. : pale pink (milky)	After 65 hours : almost decolorised (yellowish pink)	5 per cent. precipitation.
Incomplete solution ; becomes much browner. Res. : red-brown. Top liq. : brownish orange, clear	Dark brownish red. Top liq. : colourless	<i>Blue-black.</i> Op. I. : Brilliant lemon-yellow Op. II. : Original shade Op. III. : Colourless	Chestnut-brown. Top liq. : wine-yellow. In 14 days : decolorised. Res. : white. Top liq. : colourless (milky)	After 120 hours : reddish ochre-coloured	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Pluto-orange G (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brownish orange	Slight	Some-what	Slight ; becomes red-brown. Top liq. : wine-yellow	Insol.	Insol.
Congo-orange G (Bayer)	Barytes	Barium chloride	Yellowish orange	Fair	Some-what	Fair ; becomes dark umber-coloured. Top liq. : red-brown	Insol.	Insol.
Orange II B (Bayer)	Barytes	Barium chloride	Yellowish orange	Fair	Fair	Fair	Insol.	Insol.
Pigment-orange R in pulp (M. L. Br.)	Barytes	None	Reddish orange	Insol.	Fair	Somewhat	Fair	Great

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Becomes more reddish; incomplete solution. Res.: brownish orange. Top liq.: brownish orange, clear	Brownish ponceau. Top liq.: colourless	<i>Brilliant Bordeaux-red.</i> Op. I.: Colouring matter is precipitated in brownish orange-red flocks. Top liq.: colourless Op. II.: Brownish orange-red flocculent precipitate. Top liq.: golden-yellow Op. III.: Colourless	Becomes bright red-brown. After 8 days: decolorised. Res.: white. Top liq.: colourless (milky)	After 70 hours: light brownish ochre	5 per cent. precipitation.
Becomes yellower; incomplete solution. Res.: bright orange-red. Top liq.: brilliant reddish orange, clear	Bright scarlet-red. Top liq.: colourless	<i>Deep indigo-blue.</i> Op. I.: Colouring matter separates in brown flocks. Top liq.: somewhat yellowish Op. II.: orange-yellow fine precipitate. Top liq.: yellowish Op. III.: Colourless	Becomes black-brown. After 4 hours: decolorised. Res.: white. Top liq.: colourless (milky)	After 120 hours: very bright brownish red	5 per cent. precipitation.
Complete solution. Res.: white. Top liq.: brilliant brownish red	Brilliant ponceau. Top liq.: colourless	<i>Lively bright carmoisin.</i> Op. I.: Golden-yellow Op. II.: Dirty red-brown precipitate (small flocks). Top liq.: Slightly yellowish-coloured Op. III.: Bright lemon-yellow	Becomes brighter and yellower. After 1½ hour: decolorised. Res.: white. Top liq.: colourless (milky)	After 120 hours: bright brownish pink	5 per cent. precipitation.
Traces sol.	Deep brown-red. Top liq.: colourless	<i>Brilliant carmine.</i> Op. I.: Colouring matter separates in fine flocks. Top liq.: colourless Op. II.: Lively vermilion precipitate. Top liq.: colourless Op. III.: Brilliant golden-yellow	After 3 weeks' treatment: only slightly yellower	After 100 hours: dull bluish pink	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Autol-orange (Bad.)	Barytes	None	Yellowish orange (dull)	Insol.	Fair	Insol.	Great	Great
Permanent orange R in pulp (Berl.)	Barytes	Barium chloride	Reddish orange with brownish tinge	Insol.	Fair	Traces	Traces	Traces
Mikado-orange 3 RO (Mühl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark brownish orange	Insol.	Insol.	Traces ; lake becomes much browner	Insol.	Somewhat
Mikado-orange 4 R (Mühl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Deep brownish red	Insol.	Insol.	Fair ; soluble ; lake becomes dark red-brown. Top liq. : brownish yellow	Insol.	Traces

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
No effect	Becomes somewhat redder. Top liq. : colourless	<i>Dark bluish red</i> ; by transmitted light, <i>carmine</i> . Op. I. : Orange with pink tinge Op. II. : Colouring matter separates in dark red resinous flocks, which by Op. III. are readily changed to brilliant lemon-yellow in ether	Somewhat yellowish, even after prolonged treatment.	After 100 hours : very pale pink	5 per cent. precipitation.
Insoluble ; the lake, however, becomes much browner	Dark red-brown. Top liq. : colourless	<i>Brilliant dark carmine</i> . Op. I. : Colourless ; colouring matter is precipitated in flocks Op. II. : Brownish orange precipitate. Top liq. : pale pink Op. III. : Colourless or slightly yellowish	At first, no change. After 9 days : completely decolorised. Res. : white. Top liq. : colourless (milky)	After 100 hours : dirty brownish red	5 per cent. precipitation.
Becomes brighter red. Top liq. : slightly golden yellow, clear. Slightly sol.	At first reddish, then browner. Top liq. : colourless	<i>Dark indigo-blue</i> . Op. I. : Wine-yellow, constant Op. II. : Pure orange flocculent precipitate. Top liq. : golden-yellow Op. III. : Colourless	At first, chocolate-brown, then bluer. After 72 hours : decolorised. Res. : nearly white. Top liq. : colourless	After 130 hours : brick-red (reddish)	5 per cent. precipitation.
Becomes redder. Top liq. : brilliant brown-red, clear. Fairly sol.	At first redder, then browner. Sup. liq. : colourless	<i>Prussian-blue-like</i> . Op. I. : Golden-yellow, constant Op. II. : Brownish orange-red precipitate. Top liq. : golden-yellow Op. III. : Colourless	Reddish chocolate-brown. After 75 hours : decolorised. Res. : pale pink. Top liq. : colourless	After 130 hours : very bright reddish brown	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Xylidin-scarlet R (Beyer & Kegel)	Barytes	Barium chloride	Bluish scarlet	Fair	Fair (brownish orange)	Great (brilliant yellowish ponceau)	Insol.	Insol.
Scarlet 2 RX (Beyer & Kegel)	Barytes	Barium chloride	Very bluish scarlet	Fair	Some- what (dark lemon- yellow)	Fair (reddish orange)	Insol.	Insol.
Vermilion-scarlet G (Beyer & Kegel)	Barytes	Barium chloride	Pure scarlet	Some- what	Insol.	Fair (yellowish orange)	Insol.	Insol.
Vermilion-scarlet R (Beyer & Kegel)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright carmine	Fair	Insol.	Fair (reddish orange)	Insol.	Insol.
Excelsior-scarlet for lakes JN (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish carmine	Fair	Some- what (yellowish orange)	Fair (reddish orange)	Insol.	Insol.

LAKES.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Complete solution. Res. : white. Top liq. : red-brown	Becomes somewhat brighter. Top liq. : colourless	<i>Yellowish ponceau.</i> Op. I. : Bluish pink, constant Op. II. : Yellowish vermilion-red precipitate. Top liq. : brownish red Op. III. : colourless	Becomes much yellower. Top liq. : pale yellowish. After 5 hours : decolorised. Res. : white. Top liq. : colourless	In 150 hours : dirty bluish pink	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : brownish red	No effect	<i>Brilliant scarlet.</i> Op. I. : Yellowish pink, constant Op. II. : Yellowish vermilion precipitate. Top liq. : ruby-red Op. III. : Colourless	At first, no change. After 32 hours : decolorised. Res. : white. Top liq. : colourless	In 150 hours : only a little whiter	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : brownish red	Brownish orange (partly decomposed)	<i>Bright brown-red.</i> Op. I. : Yellowish pink, constant Op. II. : Vermilion red precipitate Op. III. : Colourless	At first, no change. Top liq. : pale pink, turbid. In 7½ hours : decolorised. Res. : white. Top liq. : colourless	In 150 hours : dirty bluish pink	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : brownish red	Partly decomposed	<i>Brilliant carmoisin.</i> Op. I. : Bluish pink, constant Op. II. : Beautiful bluish vermilion precipitate. Top liq. : ponceau Op. III. : Colourless	At first, no change. Top liq. : brilliant yellow-red. In 10 days : decolorised. Res. : very pale yellowish pink. Top liq. : colourless	In 150 hours : dirty brownish pink	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : brownish red	Becomes much browner. Top liq. : colourless	<i>Brownish orange.</i> Op. I. : Yellowish pink, constant Op. II. : Bright orange red precipitate. Top liq. : colourless Op. III. : Colourless	Becomes bright vermilion-red. Top liq. : colourless, clear. After 27 hours : decolorised. Res. : white. Top liq. : colourless	In 150 hours : somewhat brighter and bluer	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Excelsior-scarlet for lakes JJN (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish scarlet	Fair	Fair (red-orange)	Fair (red-orange)	Insol.	Insol.
Brilliant ponceau G (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish ponceau	Great (red-orange)	Fair (red-orange)	Great (brilliant scarlet)	Insol.	Insol.
Ponceau for lakes R (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium Chloride	Bluish carmine	Great	Fair (yellowish orange)	Great (brilliant scarlet)	Insol.	Insol.
Ponceau for lakes GG (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fieri yellowish ponceau	Fair	Fair (reddish orange)	Fair (ponceau)	Insol.	Traces
Ponceau for lakes G extra (Mühl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fieri carmine	Insol.	Insol.	Traces	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Complete solution. Res. : white. Top liq. : brownish red	Becomes deep brown-red. Top liq. : colourless	<i>Brilliant yellowish orange.</i> Op. I. : Yellowish pink, constant Op. II. : Bulky, brownish orange precipitate. Top liq. : colourless Op. III. : The whole precipitate dissolves in ether, which becomes yellowish coloured	At first, the colours somewhat brighter. Top liq. : colourless, clear. After 7 hours : decolorised. Res. : white. Top liq. : colourless (milky)	In 150 hours : much brighter and bluer	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : brown-red	Becomes dark brown-red. Top liq. : pale yellowish	<i>Lively carmine.</i> Op. I. : Bluish pink, constant, bulky Op. II. : Bulky, brownish red precipitate. Top liq. : ruby-red Op. III. : Brilliant golden-yellow	Much brighter. Top liq. : pale pink, clear. After 9 hours : decolorised. Res. : white. Top liq. : colourless (milky)	In 150 hours : dark bluish pink	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : brown-red	Deep brown-red. Top liq. : pale yellowish	<i>Brownish carmine.</i> Op. I. : Bluish pink, constant Op. II. : Vermilion-red precipitate. Top liq. : pale pink Op. III. : Colourless	Scarcely appreciably yellower. After 6½ hours : decolorised. Res. : white. Top liq. : colourless (milky)	In 150 hours : much brighter and bluer	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : brownish red	Deep brown-red. Top liq. : colourless	<i>Bluish carmine.</i> Op. I. : Yellowish pink, constant Op. II. : Orange-red precipitate. Top liq. : yellow-red, turbid Op. III. : Very faintly yellow	Much redder. Top liq. : colourless, clear. After 8½ hours : decolorised. Res. : white. Top liq. : colourless (milky)	In 150 hours : dirty brownish pink	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : dark brown-red, clear	Lake is completely decomposed. Res. : white. Top liq. : deep red-brown	<i>Deep brown-red.</i> Op. I. : Bluish pink, constant Op. II. : Reddish orange fine precipitate. Top liq. : bluish pink Op. III. : Colourless	At first, unchanged. After 8 days : decolorised. Res. : bluish grey. Top liq. : colourless (milky)	In 150 hours : dirty brownish pink	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Ponceau for lakes L (Mühl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bordeaux-red	Fair	Insol.	Fair (yellow-red)	Insol.	Insol.
Ponceau for lakes B extra (Mühl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery bluish carmine	Insol.	Insol.	Fair (yellow-red)	Insol.	Insol.
Ponceau GRLH (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery yellowish ponceau	Fair	Fair (yellow-orange)	Great (ponceau)	Traces	Traces
Ponceau GRL (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery ponceau	Fair	Fair (yellow-orange)	Great (ponceau)	Fair	Traces
Ponceau GRI (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark brownish ponceau	Fair	Somewhat (yellow-orange)	Fair (ponceau)	Fair	Traces

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Complete solution. Res. : white. Top liq. : very dark brown-red, clear	Lake is partly decomposed. Res. : brown-red. Top liq. : ruby-red	<i>Bordeaux-red</i> (reddish). Op. I. : Bluish pink, constant Op. II. : Brown-red fine precipitate, which gradually forms a brown-red liquor Op. III. : Colourless	At first, unchanged, but soon becomes a beautiful purple-red. After 6 weeks : decolorised. Res. : pale pink. Top liq. : colourless, clear	In 150 hours : bluish colcothar-like coloured	5 per cent. precipitation.
Partly dissolved. Res. : red-brown. Top liq. : dark brown-red, opaque	Lake is partly decomposed. Res. : white. Top liq. : brown-red, opaque	<i>Deep brownish carmine.</i> Op. I. : Bluish pink, constant Op. II. : At first, bluish vermilion-red precipitate, which forms a blood-red liquid Op. III. : Colourless	At first, unchanged. Top liq. : colourless. After 18 days : decolorised. Res. : white. Top liq. : colourless (milky)	In 180 hours : completely white.	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : brown-red, clear	Brownish ponceau. Top liq. : pale yellowish	<i>Lively brownish red.</i> Op. I. : Yellowish orange, constant Op. II. : Brightscarlet-red precipitate. Top liq. : yellow-red Op. III. : Brilliant golden-yellow	At first, unchanged. Top liq. : pale yellowish pink. After 7 days : decolorised. Res. : white. Top liq. : colourless.	In 180 hours : dirty brownish pink (very light)	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : brown-red, clear	Lively ponceau Top liq. : colourless	<i>Fiery scarlet.</i> Op. I. : Reddish orange, constant Op. II. : Deep ponceau precipitate. Top liq. : lively reddish orange Op. III. : Brilliant citron-yellow	At first, unchanged. Top liq. : pale yellowish pink. After 8 days : decolorised. Res. : pale pink. Top liq. : colourless (milky)	In 180 hours : dirty bluish pink (very light)	5 per cent. precipitation.
Complete solution. Res. : white. Top liq. : brown-red, clear	Dark brownish ponceau. Top liq. : colourless	<i>Blood-red.</i> Op. I. : Yellowish pink, constant Op. II. : Lively, rather bright orange-red precipitate. Top liq. : deep yellow-red Op. III. : Very slightly yellow	At first, no change. Top liq. : pale pink. After 9 days : decolorised. Res. : pale pink. Top liq. : colourless (milky)	In 150 hours : dark bluish pink	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Ponceau RL (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery bluish ponceau	Fair	Traces	Some- what	Insol.	Insol.
Ponceau 2 RL (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery bright Bordeaux- red	Fair	Traces	Some- what.	Insol.	Insol.
Ponceau 3 RL (M. L. Br.)	Barytes	Barium chloride	Bright Bordeaux- red	Insol.	Insol.	Traces	Insol.	Insol.
Ponceau 5 R (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Light bluish Bordeaux- red	Some- what	Some- what	Fair (brilliant bluish red)	Insol.	Insol.
Ponceau B extra (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brownish ponceau	Fair	Fair (yellow- red)	Fair (brownish red)	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl		
Complete solution. Res.: white Top liq.: bright brown-red, clear	No important change	<i>Vermilion-red.</i> Op. I.: Pale bluish pink, constant Op. II.: Brick-red precipitate. Top liq.: blood-red Op. III.: Colourless	At first, no change. Top liq.: pale bluish pink. After 8 days: decolorised. Res.: white. Top liq.: colourless (milky)	In 150 hours: much lighter and bluer	5 per cent. precipitation.
Complete solution. Res.: white. Top liq.: yellow-red, clear	No change	<i>Yellowish carmine.</i> Op. I.: Lively bluish pink, constant Op. II.: Orange-red flocks. Top liq.: lively ruby-red Op. III.: colourless	At first, no change. Top liq.: pale bluish pink. After 10 days: decolorised. Res.: white. Top liq.: colourless.	In 150 hours: much lighter and bluer	5 per cent. precipitation.
Complete solution. Res.: white. Top liq.: brilliant brownish-red, clear	No change of importance	<i>Brilliant carmine.</i> Op. I.: Very bluish pink, constant Op. II.: Orange-red fiery precipitate. Top liq.: almost colourless Op. III.: Colourless	At first, no change. After 5 days: decolorised. Res.: white. Top liq.: colourless	In 150 hours: somewhat lighter and bluer	5 per cent. precipitation.
Lake becomes very dark red-brown, later completely dissolved. Res.: white. Top liq.: deep red-brown, nearly black, opaque	Lake is partly decomposed. Res.: reddish. Top liq.: brown, almost black, opaque	<i>Deep bluish violet.</i> Op. I.: Very lively bluish pink, constant Op. II.: carmine-red, opaque solution. Res.: white Op. III.: colourless	At first, deep Bordeaux-red, then colcothar-like coloured. After 48 hours: decolorised. Res.: dirty bluish pink. Top liq.: colourless, clear	In 150 hours: very much lighter (dirty bluish pink)	5 per cent. precipitation. Precipitation only occurs on distinct measurement of the reagents.
Very dark chocolate-brown. Lake not decomposed. Top liq.: colourless	Lake becomes deep violet, nearly black. Top liq.: pale brownish (nearly colourless)	<i>Deep bluish green.</i> Op. I.: brownish orange-red precipitate, partly soluble in water, giving a yellow-red liquid Op. II.: Brownish orange precipitate. Top liq.: nearly colourless (pale pink) Op. III.: Colourless	Becomes at once red-brown, then quickly a light brick-red. After 13 hours: decolorised. Res.: white. Top liq.: colourless (milky)	In 150 hours: dirty light brown	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Palatin-ponceau for lakes GG (Bad.)	Barytes	Barium chloride	Very fiery carmine	Fair	Somewhat (golden-yellow)	Fair	Traces	Insol.
Palatin-ponceau for lakes G (Bad.)	Barytes	Barium chloride	Carmine	Fair	Somewhat (golden-yellow)	Fair	Insol.	Somewhat
Ponceau for lakes LN (Bad.)	Barytes	Barium chloride	Rather dull ponceau (brownish)	Fair	Somewhat (reddish golden-yellow)	Fair	Traces	Insol.
Ponceau for lakes LE (Bad.)	Barytes	Barium chloride	Lively light Bordeaux-red	Great	Slight	Fair	Insol.	Insol.
Ponceau for lakes GN (Bad.)	Barytes	Barium chloride	Bluish ponceau (not brilliant)	Fair	Fair (reddish golden-yellow)	Fair	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl		
Completely decomposed. Res.: white. Top liq.: brownish red, transparent	Deep brownish Bordeaux-red. Top liq.: colourless	<i>Lively yellowish ponceau.</i> Op. I.: Very yellowish pink, constant Op. II.: Beautiful scarlet flocculent precipitate. Top liq.: lively yellow-red Op. III.: Colourless	At first, no change. Top liq.: colourless. In 24 hours: decolorised. Res.: white. Top liq.: colourless (milky)	In 150 hours: much bluer	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: brown-red, clear	Lively brownish ponceau. Top liq.: colourless	<i>Lively yellowish carmine.</i> Op. I.: Yellowish orange, constant Op. II. Very voluminous fiery orange-red precipitate. Top liq.: reddish yellow Op. III.: pale yellowish	At first, no change. Top liq.: colourless. After 72 hours: decolorised. Res.: white. Top liq.: colourless (milky)	In 150 hours: much bluer	5 per cent. precipitation.
Decomposed. Res.: white. Top liq.: brown-red, transparent	Lively brownish ponceau. Top liq.: colourless	<i>Raspberry red.</i> Op. I.: Pale yellowish pink, constant Op. II.: Scarlet-red precipitate. Top liq.: orange-red Op. III.: Brilliant yellow	At first, no change. Top liq.: colourless. After 7 hours: decolorised. Res.: white. Top liq.: colourless (milky)	In 150 hours: much brighter and bluer	5 per cent. precipitation.
Decomposed. Res.: white. Top liq.: brown-red, transparent	Becomes much browner. Top liq.: colourless	<i>Brownish ponceau.</i> Op. I.: Yellowish pink, constant, turbid (slight fluorescence) Op. II.: Scarlet-red flocculent precipitate. Top liq.: orange-red Op. III.: Colourless	At first, no change. Top liq.: colourless. After 22 hours: completely decolorised. Res.: white. Sup. liq.: colourless (milky)	In 150 hours: somewhat brighter and bluer	5 per cent. precipitation.
Complete solution. Res.: white. Top liq.: brown-red, transparent	No effect	<i>Deep brown-red.</i> Op. I.: Yellowish pink, constant Op. II.: Very lively orange-red, dense precipit. Top liq.: orange Op. III.: Colourless	At first, no change. Top liq.: colourless. After 9 hours: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 150 hours: brighter and bluer	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Ponceau for lakes RZ (Bad.)	Barytes	Barium chloride	Bordeaux-red	Fair	Traces	Fair	Insol.	Insol.
Ponceau for lakes 3 RN (Bad.)	Barytes	Barium chloride	Bluish Bordeaux-red	Some-what	Insol.	Fair	Insol.	Insol.
Brilliant red G for lakes (Bad.)	Barytes	Barium chloride	Fiery ponceau	Some-what	Fair (golden-yellow)	Fair	Insol.	Insol.
Brilliant red R for lakes (Bad.)	Barytes	Barium chloride	Bluish carmine	Some-what	Fair (golden-yellow)	Fair	Insol.	Insol.
Fast red AV (Bad.)	Barytes	Barium chloride	Maroon	Great	Great (ruby-red)	Difficult (bluish red)	Some-what	Fair

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.	In Direct Sunlight.	Special Remarks.
Complete solution. Res.: white. Top liq.: brown-red transparent	Somewhat lighter	<i>Brownish carmine.</i> Op. I.: Bluish pink, constant Op. II.: Dense, vermilion-red precipitate. Top liq.: bluish pink Op. III.: Colourless	At first, no change. Top liq.: colourless. After 5 days: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 150 hours: brighter and bluer	5 per cent. precipitation.
Decomposed. Res.: white. Top liq.: brown-red	No effect of importance	<i>Lively bluish carmine.</i> Op. I.: Bluish pink, constant Op. II.: Beautiful, finely flocculent vermilion-red precipitate. Top liq.: yellowish pink Op. III.: Colourless	At first, no change. After 11 days: completely decolorised. Res.: yellowish white. Top liq.: colourless (milky)	In 150 hours: only a little brighter and bluer	5 per cent. precipitation.
Lake partly decomposed. Res.: brick-red. Top liq.: ruby-red, opaque	Partly decomposed. Res.: brown-red. Top liq.: red-brown, transparent ruby-red	<i>Brilliant cherry-red.</i> Op. I.: Yellowish orange, constant Op. II.: Beautiful, finely flocculent vermilion-red precipitate. Top liq.: bright reddish orange Op. III.: Wine-yellow	At first, no change. After 4 days: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 150 hours: very bright yellowish pink	5 per cent. precipitation.
Complete solution. Res.: white. Top liq.: ruby-red, transparent	Partly decomposed. Res.: light brownish red. Top liq.: deep red-brown, transparent ruby-red	<i>Brilliant Bordeaux-red.</i> Op. I.: Reddish orange, constant Op. II.: Finely flocculent vermilion-red precipitate. Top liq.: yellow-red Op. III.: Colourless	At first, no change. After 11 days: completely decolorised. Res.: reddish white. Top liq.: colourless (milky)	In 150 hours: very bright bluish pink (dirty)	5 per cent. precipitation.
Partly decomposed. Res.: brown-red. Top liq.: ruby-red, transparent	Lake almost completely decomposed. Res.: bluish red. Top liq.: deep ruby-red	<i>Blue-black</i> ; by transmitted light, <i>deep bluish violet.</i> Op. I.: Bluish pink, constant Op. II.: Bulky, brick-red precipitate. Top liq.: pale brownish yellow Op. III.: Pale orange with reddish tinge	Brilliant red-brown. Top liq.: colourless. After 7 days: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 150 hours: dirty brownish grey (very bright)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Brilliant carmine L (Bad.)	Barytes	Barium chloride	Very fiery bluish carmine	Traces	Traces (bluish pink)	Somewhat	Insol.	Insol.
Astacin-red B (Bad.)	Barytes	Barium chloride	Very bright bluish carmine	Insol.	Insol.	Insol.	Insol.	Insol.
Erythrin X for lakes (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride (special proportions of weight)	Bluish Bordeaux-red	Fair	Traces	Fair	Traces	Insol.
Ponceau G for lakes (Bad.)	Barytes	Barium chloride	Fiery yellowish ponceau	Fair	Somewhat (yellowish orange)	Fair	Traces	Somewhat

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Lake partly decomposed. Res.: bluish red. Top liq.: ruby-red, transparent	Partly decomposed. Res.: reddish brown. Top liq.: ruby-red, transparent	<i>Lively bluish carmoisin.</i> Op. I.: Bluish pink, constant Op. II.: Bluish carmine, fine precipitate. Top liq.: colourless Op. III.: Colourless	At first, somewhat more brilliant. After 7 days: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 150 hours: much brighter and bluer	5 per cent. precipitation.
At first, brick-red, then completely decomposed. Res.: white. Top liq.: dirty yellow-red, opaque	At first, brick-red, then deep ponceau. Some colouring matter is dissolved. Res.: very lively ponceau. Top liq.: yellow-red, transparent	<i>Very bright scarlet-red.</i> Op. I.: At first scarlet-red, cheesy precipitate, which slowly dissolves in water (golden-yellow) Op. II.: Fine light orange-red precipitate. Top liq.: colourless Op. III.: Colourless	At first, no change. Top liq.: colourless. After 14 days: completely decolorised. Res.: white. Top liq.: colourless	In 150 hours: much bluer	5 per cent. precipitation.
Lake decomposed. Res.: white. Top liq.: black-brown, opaque	Completely decomposed. Res.: white. Top liq.: red-brown, opaque	<i>Brilliant red-violet.</i> Op. I.: Bluish pink, constant Op. II.: brown-red, clear solution Op. III.: Colourless	At first, colcothar-like coloured. Top liq.: colourless. After 3 weeks: decolorised. Res.: pale bluish pink. Top liq.: colourless (milky)	In 100 hours: much brighter and bluer	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: ponceau, clear	At first, browner; later, brown-red jelly	<i>Fiery carmine.</i> Op. I.: Yellowish-orange, constant, clear Op. II.: Scanty, dull yellowish orange precipitate. Top liq.: brilliant reddish orange Op. III.: Brilliant lemon-yellow liquid	At first, no change. After 12 days: Res.: pale pink. Top liq.: colourless (clear)	In 100 hours: dirty bluish pink	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Ponceau BN (Bad.)	Barytes	Barium chloride	Very lively carmine	Great	Somewhat (yellow-orange)	Fair	Traces	Somewhat
Ponceau R for lakes (Bad.)	Barytes	Barium chloride	Bluish carmine	Great	Somewhat (yellow-orange)	Fair	Traces	Traces
Ponceau RR for lakes (Bad.)	Barytes	Barium chloride	Raspberry-coloured	Fair	Insol.	Somewhat	Traces	Insol.
Fast ponceau B (Bad.)	Barytes	Barium chloride	Bright brown-red	Fair	Fair (yellowish ponceau)	Fair	Traces	Fair

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Completely decomposed. Res.: white. Top liq.: brownish ponceau, clear	Becomes browner. Top liq.: colourless	<i>Yellowish carmine.</i> Gradually becomes darker and browner. Op. I.: At first bluish pink, then yellower Op. II.: A beautiful vermilion-red flocculent precipitate, which quickly falls to the bottom. Top liq.: orange-red, clear Op. III.: Brilliant lemon-yellow	At first, no change. After 4 days: decolorised. Res.: pale flesh-coloured. Top liq.: colourless (milky)	In 100 hours: much brighter and bluer	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: ponceau, clear	Becomes somewhat browner. Top liq.: colourless	<i>Somewhat more yellowish.</i> Op. I.: Bluish pink, clear, constant Op. II.: Fiery orange-red precipitate, in flocks, which settle quickly. Top liq.: carmine, clear Op. III.: Colourless	At first, no change. After 7 days: completely decolorised. Res.: yellowish white. Top liq.: colourless (milky)	In 100 hours: much brighter and bluer	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: ponceau, clear	Much browner. Top liq.: colourless	<i>Brilliant brownish ponceau.</i> Op. I.: Bluish pink, constant, clear Op. II.: Vermilion-red finely flocculent precipitate. Top liq.: reddish orange Op. III.: Colourless	At first, no change. In 7 days: decolorised. Res.: reddish white. Top liq.: colourless (milky)	In 100 hours: becomes a little brighter and bluer	5 per cent. precipitation.
Slight action. Res.: red-brown. Top liq.: brownish pink, clear	Blackish violet-red. Top liq.: pale bluish pink	<i>Dark bluish green.</i> Op. I.: Cheesy, dirty orange precipitate, which changes to bluish pink Op. II.: Voluminous dark brown-red precipitate. Top liq.: colourless Op. III.: Colourless	At first, red-brown. After 48 hours: completely decolorised. Res.: brownish white. Top liq.: colourless (milky)	In 100 hours: quite brick-red	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Fast red BN (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Deep bluish Bordeau- red	Fair	Traces	Great	Insol.	Traces
Ponceau GL (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Yellowish ponceau	Fair	Some- what (golden- yellow)	Somewhat	Traces	Traces
Ponceau GL 57298 (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very yellowish ponceau (nearly orange)	Fair	Fair (reddish orange)	Great	Insol.	Fair
Ponceau RL (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish carmine	Fair	Some- what (brown- ish yellow)	Great	Insol.	Insol.
Ponceau RL 57299 (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very lively bluish carmine	Fair	Some- what (brown- ish yellow)	Great	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Completely decomposed. Res.: white. Top liq.: ruby-red	Somewhat browner. Top liq.: colourless	<i>Deep indigo-blue.</i> Op. I.: Raspberry-coloured, constant Op. II.: Bordeaux-red fine precipitate. Top liq.: ruby-red Op. III.: Colourless	At first, deep purple-red. Top liq.: colourless. In 8 days: completely decolorised. Res.: reddish white. Top liq.: colourless (milky)	In 60 hours: dirty reddish grey and much brighter	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: brilliant ponceau, transparent	Very faintly brown. Top liq.: pale yellowish	<i>Brownish orange-red.</i> Op. I.: Pale reddish yellow, clear Op. II.: Gives a pale orange-red flocculent precipitate. Top liq.: reddish orange Op. III.: Brilliant lemon-yellow	At first, no change. In 8 days: completely decolorised. Res.: reddish white. Top liq.: colourless (milky)	In 60 hours: brighter, dirty brownish pink	5 per cent. precipitation.
Partly decomposed. Res.: ponceau. Top liq.: red-brown, transparent	Becomes much browner. Top liq.: pale brownish yellow	<i>Deep brownish red.</i> Op. I.: Yellowish pink, constant, clear Op. II.: Brownish red dense precipitate. Top liq.: pale yellow, nearly colourless Op. III.: Brilliant golden-yellow	At first, no change. After 5 days: completely decolorised. Res.: white (faintly reddish). Top liq.: colourless (milky)	In 50 hours: pale dirty yellowish pink, nearly white	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: ruby-red, transparent	Somewhat browner. Top liq.: colourless	<i>Brilliant scarlet-red.</i> Op. I.: Yellowish pink, constant, clear Op. II.: Beautiful scarlet-red bulky precipitate. Top liq.: reddish orange Op. III.: Faintly yellowish	At first, no change. In 26 hours: completely decolorised. Res.: reddish white. Top liq.: colourless (milky)	In 100 hours: much brighter and bluer	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: red-brown, opaque	Dark red-brown. Top liq.: colourless	<i>Deep cherry-red.</i> Op. I.: Pale bluish pink, clear Op. II.: Yellowish vermilion-red flocks. Top liq.: lively reddish orange Op. III.: Pale yellowish	At first, no change. After 4 days: completely decolorised. Res.: reddish white. Top liq.: colourless (milky)	In 100 hours: much brighter and bluer	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Ponceau RRL (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish carmine	Fair	Insol.	Great	Insol.	Insol.
Ponceau 3 RB (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brownish ponceau	Fair	Great (yellow- ish pon- ceau)	Great	Traces	Traces
Ponceau 4 R (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride, in distinct proportions	Bluish carmine	Some- what	Some- what (yellow- ish pon- ceau)	Great	Insol.	Insol.
Ponceau 44099 (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Yellowish Bordeaux- red	Fair	Some- what (yellow- ish orange)	Great	Insol.	Insol.
Ponceau 4 GBL (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Yellowish orange	Fair	Some- what (lemon- yellow)	Fair	Fair	Somewhat

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Partly decomposed. Res.: carmine. Top liq.: ruby-red, transparent	Somewhat browner. Top liq.: colourless	<i>Brilliant brownish red.</i> Op. I.: Bluish pink, constant, clear Op. II.: Bluish vermilion-red flocculent precipitate. Top liq.: orange, clear Op. III.: Colourless	At first, no change. In 10 days: completely decolorised. Res.: white. Top liq.: pale yellowish pink (milky)	In 100 hours: much brighter and bluer	5 per cent. precipitation.
Partly decomposed. Res.: red-brown. Top liq.: ruby-red, transparent	Deep red-brown, nearly black. Top liq.: colourless	<i>Brilliant emerald-green.</i> Op. I.: Bluish pink, constant Op. II.: Changing through blue and red-violet; brick-red dense precipitate. Top liq.: colourless Op. III.: Pale yellowish pink	Becomes much browner. In 7 hours: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 60 hours: shade entirely changed (yellowish brick-red)	5 per cent. precipitation.
Partly decomposed. Res.: bluish vermilion-red. Top liq.: ruby-red, transparent	Partly decomposed. Res.: brown-red. Top liq.: carmine, transparent	<i>Deep bluish Bordeaux-red.</i> Op. I.: Very bluish pink, constant, clear Op. II.: Voluminous bluish carmine precipitate. Top liq.: pink Op. III.: Colourless	At first, no change. After 9 days: completely decolorised. Res.: pale pink. Top liq.: reddish white (milky)	In 60 hours: nearly decolorised (pale pink)	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: ruby-red, transparent	Somewhat browner. Top liq.: colourless	<i>Lively carmine.</i> Op. I.: Yellowish pink, constant, clear Op. II.: Scarlet-red flocculent precipitate. Top liq.: yellowish orange. Op. III.: Colourless	At first, no change. After 3 days: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 75 hours: dirty bluish pink	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: brownish red	No change of colour. Top liq.: wine-yellow	<i>Lively scarlet-red.</i> Op. I.: Golden-yellow, constant, clear Op. II.: Fine orange-yellow precipitate. Top liq.: golden-yellow Op. III.: Brilliant lemon-yellow	At first, no change. In 6 hours: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 60 hours: pale brownish pink; nearly colourless	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Ponceau BO extra (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively bluish carmine	Fair	Fair (yellowish carmine)	Great	Insol.	Fair
Ponceau 6 RB (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Raspberry colour	Fair	Great (carmine)	Great	Traces	Traces
Ponceau 58940 (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brownish scarlet	Fair	Great (yellowish orange)	Great	Great	Great
Ponceau 64580 (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Pale dirty brownish ponceau	Fair	Great (reddish orange)	Great	Traces	Traces
Ponceau 3 RL (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Raspberry-colour	Fair	Insol.	Fair	Insol.	Insol.

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl.	In Direct Sunlight.	Special Remarks.
Completely decomposed. Res. : white. Top liq. : reddish black, opaque	Reddish black. After a long time standing, partly decomposed. Res. : reddish grey. Top liq. : nearly black, opaque	<i>Deep red-violet.</i> Op. I.: Cheesy, blackish precipitate which quickly dissolves to (constant) bluish pink Op. II.: Brick-red flocculent precipitate. Top liq.: pink Op. III.: Colourless	Dark brown-red. In 5 days : completely decolorised. Res. : Very pale pink Top liq.: colourless (milky)	In 50 hours : complete change of shade (pale brownish pink)	5 per cent. precipitation.
Partly decomposed. Res. : ruby-red. Top liq. : reddish black, opaque	Somewhat browner. Top liq. : colourless	<i>Lively Prussian-bluish.</i> Op. I.: Raspberry-coloured, constant, clear Op. II.: Ruby-red solution (separately, white carrier) Op. III.: Colourless	Much browner. Shortly afterwards bright light brown. In 6 days : completely decolorised. Res. : reddish white. Top liq.: colourless (milky)	In 50 hours : complete change of shade (pale dirty brownish pink)	5 per cent. precipitation.
Partly decomposed. Res. : yellowish ponceau. Top liq. : ruby-red, transparent	Becomes much browner. Top liq. : colourless	<i>Brilliant cherry-red.</i> Op. I.: Yellowish orange, constant, clear Op. II.: Dense, bright scarlet-red precipitate. Top liq. : colourless Op. III.: Brilliant golden-yellow.	At first, no change. In 5 days : completely decolorised. Res. : reddish white. Top liq. : colourless (milky)	In 60 hours : nearly completely decolorised (dirty brownish pink)	5 per cent. precipitation.
Partly decomposed. Res. : rust-brown. Top liq. : brownish red, transparent	Becomes reddish black. Top liq. : pale yellowish brown	<i>Brilliant emerald-green.</i> Op. I.: Bluish pink, constant, clear Op. II.: Changing through blue and red-violet ; deep brown-red precipitate. Top liq. : pale brownish yellow Op. III.: Pale yellowish pink	At first, no change. In 5 days : completely decolorised. Res. : white. Top liq. : colourless (milky)	In 50 hours : complete change of shade (very light brownish pink)	5 per cent. precipitation.
Becomes much brighter ; later, it is completely decomposed. Res. : white. Top liq. : carmine, transparent	Becomes brighter and yellower. Top liq. : colourless	<i>Very fiery yellowish carmine.</i> Op. I.: Bluish pink, constant, clear Op. II.: Bluish vermilion-red, bulky precipitate. Top liq. : pale yellowish pink Op. III.: Colourless	At first, no change. In 4 days : completely decolorised. Res. : white. Top liq. : colourless (milky)	In 62 hours : only slightly bluer	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Ponceau GR (W. ter Meer)	Barytes	Barium chloride	Yellowish carmine	Fair	Fair (yellow-orange)	Fair	Insol.	Insol.
Ponceau 2 R (W. ter Meer)	Barytes	Barium chloride	Raspberry-colour	Fair	Fair (golden-yellow)	Fair	Insol.	Insol.
Ponceau 3 R (W. ter Meer)	Barytes	Barium chloride	Raspberry-colour	Some-what	Traces	Fair	Insol.	Insol.
Fast red BT (Bayer)	Barytes	Barium chloride	Brownish Bordeaux-red	Some-what	Some-what (ruby-red)	Great	Traces	Traces

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Complete decomposition. Res.: white. Top liq.: brownish ponceau, clear	Becomes rather yellower. Top liq.: pale brownish yellow	<i>Brownish ponceau.</i> Op. I.: Yellowish pink, constant, clear Op. II.: Scarlet-red finely flocculent precipitate, which quickly falls to bottom. Top liq.: colourless Op. III.: Brilliant lemon-yellow	At first, no change. In 90 hours: completely decolorised. Res.: reddish white. Top liq.: colourless (milky)	In 75 hours: strong effect (dirty yellowish pink)	5 per cent. precipitation.
Complete decomposition. Res.: white. Top liq.: brownish ponceau, clear	No effect.	<i>Brilliant yellowish carmine.</i> Op. I.: Yellowish pink, constant, clear Op. II.: Brilliant vermilion-red flocculent precipitate. Top liq.: colourless Op. III.: Brilliant lemon-yellow	At first, no change. In 22 hours: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 75 hours: strong effect (dirty bluish pink)	5 per cent. precipitation.
Complete decomposition. Res.: white. Top liq.: carmine-red, clear	Becomes somewhat brighter and yellower. Top liq.: colourless	<i>Lively yellowish carmine.</i> Op. I.: Bluish pink, constant, clear Op. II.: Beautiful vermilion-red finely flocculent precipitate. Top liq.: yellowish pink Op. III.: Colourless	At first, no change. In 4 days: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 62 hours: much lighter and bluer	5 per cent. precipitation.
Partly decomposed. Res.: red-brown. Top liq.: ruby-red, clear	Somewhat browner. Top liq.: colourless	<i>Indigo-blue.</i> Op. I. Very bluish pink, constant, clear Op. II. Colcothar-like coloured finely flocculent precipitate. Top liq.: colourless Op. III.: Brilliant brownish golden-yellow	At first, no change. In 90 hours: completely decolorised. Res.: very pale pink. Top liq.: colourless (milky)	In 62 hours: very much lighter and dirtier (bluish colcothar-like colour)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Brilliant helio-purpurin B (Bayer)	Barytes	Barium chloride	Beautiful bluish carmine	Traces	Traces	Somewhat	Insol.	Insol.
Helio-purpurin 3 BL powder (Bayer)	Barytes	Barium chloride	Pale yellowish pink (like madder-pink)	Insol.	Fair (yellow-orange)	Fair	Insol.	Insol.
Helio-purpurin 5 BL powder (Bayer)	Barytes	Barium chloride	Yellowish pink (like madder-pink)	Traces	Fair (yellow-red)	Fair	Insol.	Insol.
Helio-purpurin 10 BL (Bayer)	Barytes	Barium chloride	Yellowish Bordeaux-red	Some-what	Fair (bluish ponceau)	Fair	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Complete decomposition. Res.: white. Top liq.: deep brown-red, clear	Much browner. Top liq.: lively brownish red, clear	<i>Brilliant cherry-red.</i> Op. I.: Cheesy black-brown precipitate, dissolves slowly to a constant yellowish pink Op. II.: Bluish carmine finely flocculent precipitate. Top liq.: ruby-red Op. III.: Colourless	At first, no change. In 1 hour: completely decolorised. Res.: white. Top liq.: colourless (clear)	In 62 hours: complete change of shade (dirty brownish red)	5 per cent. precipitation.
Complete decomposition. Res.: white. Top liq.: bright yellowish scarlet, clear	Lively scarlet, later brownish. Top liq.: yellowish orange, clear	<i>Brilliant brown-red.</i> Op. I.: Bluish pink, constant, clear Op. II.: Yellowish red fine precipitate. Top liq.: colourless Op. III.: Brilliant brownish orange	At first, no change. In 30 minutes: decolorised. Res.: white. Top liq.: colourless (milky)	In 62 hours: much brighter and bluer	5 per cent. precipitation.
Complete decomposition. Res.: white. Top liq.: beautiful reddish scarlet, clear	Brilliant carmine, later dark red-brown. Top liq.: pale brownish red, clear	<i>Very brilliant brownish carmine.</i> Op. I.: Very bluish pink, constant, clear Op. II.: Dark red-brown very fine precipitate. Top liq.: colourless Op. III.: Brilliant brownish orange	At first, no change. In 20 minutes: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 62 hours: much bluer, without the intensity being much lessened	5 per cent. precipitation. [A similar lake is obtained from Helio-purpurin 7 BL (Bayer).—TRANSLATOR.]
Slight effect. Top liq.: reddish orange, transparent	Becomes a lively raspberry colour. Top liq.: colourless	<i>Brilliant indigo-blue.</i> Op. I.: Yellowish pink, constant, clear Op. II.: Very dark bluish-colour-like coloured precipitate. Top liq.: pale brownish red Op. III.: A scarcely visible pink tinge	At first, darker. In 90 hours: decolorised. Res.: white (reddish). Top liq.: colourless (milky)	In 62 hours: only slightly changed (somewhat bluish)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Fast red E conc. 130 (Beyer & Kegel)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Raspberry- coloured	Fair	Fair (brown- ish- orange)	Great	Insol.	Insol.
Bordeaux G double conc. (Beyer & Kegel)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark bluish Bordeaux- red	Great	Great (brown- ish ponceau)	Great	Some- what	Somewhat
Brilliant cro- cein 9 B (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively bluish Bordeaux	Some- what	Slight (bluish pink)	Great	Insol.	Insol.
Brilliant crocein B (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery yellowish carminé	Fair	Fair (yellow- ish orange)	Fair	Insol.	Somewhat
Brilliant crocein M (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish carminé	Fair	Fair (reddish orange)	Fair	Insol.	Somewhat

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.	In Direct Sunlight.	Special Remarks.
Completely decomposed. Res.: white. Top liq.: brownish red, opaque	Dark rust-brown. Top liq.: ruby-red, transparent	<i>Very lively red-violet.</i> Op. I.: Bluish pink, constant, clear Op. II.: Bright carmine. Res.: white (carrier) Op. III.: Colourless	At first, darker. After 74 hours: decolorised. Res.: white (reddish). Top liq.: colourless (milky)	In 46 hours: very pale dirty reddish grey	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: brown-red, opaque	Deep brownish red. Top liq.: colourless	<i>Prussian-bluish.</i> Op. I.: Very bluish pink, constant, clear Op. II.: Brownish Bordeaux-red fine precipitate. Top liq.: colourless Op. III.: Colourless	At first, darker. In 74 hours: completely decolorised. Res.: reddish grey, bright. Top liq.: colourless (milky)	In 50 hours: much paler and greyer	5 per cent. precipitation.
Partly decomposed. Res.: colcothar colour. Top liq.: blackish-brown, opaque	Deep red-brown. Top liq.: deep brown-red, clear	<i>Brilliant indigo-blue.</i> Op. I.: Very bluish pink, clear, constant Op. II.: Bluish carmine solution. Res.: white (carrier) Op. III.: Colourless	At first, much browner. In 11 days: completely decolorised. Res.: pale pink. Top liq.: colourless (milky)	In 70 hours: dull dirty red	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: blackish-brown-red, opaque	Deep red-brown. Top liq.: bright red-brown, clear	<i>Brilliant crimson.</i> Op. I.: Pale yellowish pink, clear, constant Op. II.: Dense brown-red precipitate. Top liq.: yellowish orange Op. III.: Colourless	At first, brick-red. In 8 hours: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 50 hours: nearly colourless (dirty yellowish grey)	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: blackish brown, opaque	Deep red-brown. Top liq.: colourless	<i>Brilliant bluish carmoisin.</i> Op. I.: Dark brown precipitate, dissolving reddish orange, constant Op. II.: Dense blackish brown precipitate. Top liq.: brilliant brownish red Op. III.: Colourless	At once, brick-red. In 60 hours: completely decolorised. Res.: reddish white. Top liq.: colourless (milky)	In 50 hours: completely discoloured (dirty reddish grey)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Brilliant crocein B ₀₀ (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively bluish carmine	Fair	Fair (reddish orange)	Fair	Insol.	Somewhat
Brilliant crocein M ₀₀ (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very bright yellowish carmine	Fair	Fair (yellow- ish orange)	Fair	Insol.	Fair
Amaranth B (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Deep bluish Bordeaux- red	Great	Traces	Fair	Insol.	Insol.
Cloth-red O (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish Bordeaux- red	Some- what	Fair (brown- ish red)	Great	Fair (brown- ish yellow)	Fair (brownish yellow)
Pigment- scarlet 3 B (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish carmine	Some- what	Traces	Traces	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Completely decomposed. Res.: white. Top liq.: black-brown, opaque	Completely decomposed (as with NaOH 12%)	<i>Lively red-violet.</i> Op. I.: Cheesy, brown precipitate, dissolving yellowish pink, constant Op. II.: Yellow-red fine precipitate. Top liq.: brilliant yellow-red Op. III.: Colourless	At first, darker and browner. In 1 hour: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 60 hours: completely discoloured (pale yellowish pink)	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: black-brown, opaque	Deep red-brown. Top liq.: bright brownish red, clear	<i>Brilliant cherry-red.</i> Op. I.: Yellowish orange, constant, clear Op. II.: Brownish orange fine precipitate. Top liq.: brilliant reddish orange Op. III.: Colourless	At first, darker and browner. In 40 minutes: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 50 hours: completely discoloured (very pale yellowish grey)	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: dark blue-violet, opaque	Very dark bluish violet. Top liq.: colourless	<i>Brilliant indigo-blue</i> (greenish). Op. I.: Lively red-violet, constant Op. II.: Bluish Bordeaux-red fine precipitate. Top liq.: nearly colourless Op. III.: Colourless	At once, brick-red. In 4 hours: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 60 hours: much lighter and bluer	5 per cent. precipitation.
Slightly altered. Top liq.: pale brownish	Darker and browner. Top liq.: colourless	<i>Prussian-bluish</i> (red reflex). Op. I.: Bluish red precipitate, which dissolves very bluish, clear, constant Op. II.: Dense, crimson precipitate. Top liq.: colourless Op. III.: Colourless	At first, no change. In 6½ days: completely decolorised. Res.: very light reddish grey. Top liq.: colourless (clear)	In 80 hours: becomes slightly bluer	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: brown-red	Brighter and yellower; later, entirely decomposed. Res.: white. Top liq.: yellow-red	<i>Brownish scarlet-red.</i> Op. I.: Pale reddish yellow, constant, clear Op. II.: Orange-yellow flocculent precipitate. Top liq.: colourless Op. III.: Colourless	At first, no change. In 11 days: completely decolorised. Res.: pale flesh-coloured. Top liq.: colourless (clear)	In 80 hours: much brighter and more bluish	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Crystal-ponceau 6 R (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Yellowish carmoisin	Fair	Fair (brownish orange)	Fair	Insol.	Insol.
Brilliant crocein B (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright carmine	Fair	Somewhat (reddish yellow)	Fair	Traces	Fair
Brilliant crocein BB (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very fiery bluish carmine	Fair	Somewhat (yellowish orange)	Fair	Traces	Fair
Brilliant crocein 5 B (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish carmine	Fair	Somewhat (yellow-orange)	Fair	Traces	Somewhat
Brilliant crocein, bluish (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very fiery carmine	Fair	Somewhat (yellow-orange)	Fair	Traces	Great

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl.		
Completely decomposed. Res.: white. Top liq.: dark brown-red, dull	Much browner; then quite decomposed. Res.: white. Top liq.: red-brown	<i>Beautiful blue-violet.</i> Op. I.: Yellowish pink, constant, clear Op. II.: Bluish carmine solution. Res.: white (carrier) Op. III.: Colourless	At first, no change. In 12 days: completely decolorised. Res.: very pale pink. Top liq.: colourless (clear)	In 75 hours: completely discoloured (dirty reddish grey)	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: dark red-brown, opaque	Deep red-brown; partly decomposed. Res.: rust-brown. Top liq.: black-brown	<i>Very fiery bluish carmoisin.</i> Op. I.: Brownish orange, constant, clear Op. II.: Dark-brown dense precipitate. Top liq.: yellowishorange Op. III.: Brilliant lemon-yellow	Much browner. In 75 hours: completely decolorised. Res.: reddish white. Top liq.: colourless (clear)	In 80 hours: much faded (brick-red)	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: reddish brown, opaque	Deep red-brown, nearly black; completely decomposed, as with NaOH 12° B.	<i>Lively carmoisin.</i> Op. I.: Yellowish pink, constant, clear Op. II.: Bulky red-brown precipitate. Top liq.: orange Op. III.: Lemon-yellow, less brilliant	Much more brownish. In 75 hours: completely decolorised. Res.: reddish white. Top liq.: colourless (milky)	In 80 hours: much faded (whitish yellow-grey)	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: red-brown, opaque	Red-brown, nearly black; completely decomposed as above	<i>Fiery red-violet.</i> Op. I.: Pink, constant, clear Op. II.: Scanty, very dark reddish brown precipitate. Top liq.: carmine Op. III.: Colourless	Much browner. In 10 days: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 80 hours: nearly colourless	5 per cent. precipitation.
Same as last mentioned	Same as last mentioned	<i>Fiery red-violet.</i> Op. I.: Yellowish pink, constant, clear Op. II.: Dense, reddish brown dark precipitate. Top liq.: pale bluish pink Op. III.: Colourless	Much more brownish. In 10 days: completely decolorised. Res.: very light flesh-colour. Top liq.: colourless (clear)	In 80 hours: much faded (whitish brick-red)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Brilliant crocein R (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright carmine (yellowish)	Fair	Sparing (golden- yellow)	Fair	Traces	Fair
Brilliant crocein, yellowish (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Carmine	Fair	Some- what (orange)	Fair	Traces	Fair
Bordeaux ^o & (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish Bordeaux- red	Fair	Some- what (orange)	Fair	Insol.	Insol.
Bordeaux R (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish Bordeaux- red	Fair	Sparing (bluish pink)	Fair	Insol.	Insol.
Bordeaux- red ^o (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish Bordeaux- red	Fair	Fair (ruby red)	Great	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl.		
Completely decomposed. Res.: white. Top liq.: yellowish brown, opaque	Bright red-brown. Top liq.: reddish brown, clear	<i>Brilliant cherry-red.</i> Op. I.: Golden-yellow, constant, clear Op. II.: Scanty, dark-brown precipitate. Top liq.: golden-yellow Op. III.: Brilliant golden-yellow	Much browner. In 75 hours: completely decolorised. Res.: reddish white. Top liq.: colourless (milky)	In 80 hours: much faded (yellowish grey)	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: red-brown, opaque	Deep red-brown; later, completely decomposed. Res.: white. Top liq.: deep black-brown, opaque	<i>Brilliant red-violet.</i> Op. I.: Bluish pink, constant, clear Op. II.: Dense, dark-brown (umber) precipitate. Top liq.: very pale reddish yellow Op. III.: Colourless	Much browner. In 12 hours: completely decolorised. Res.: white. Top liq.: colourless (milky)	Completely faded in 75 hours	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: ruby-red, transparent	Much redder and brighter. Top liq.: colourless	<i>Deep indigo-blue</i> (greenish). Op. I.: Very bluish pink, constant, clear Op. II.: Dense, Bordeaux-red precipitate. Top liq.: pale bluish pink Op. III.: Colourless	At first, no change. In 79 hours: completely decolorised. Res.: white (with violet tinge). Top liq.: colourless (milky)	Much faded. In 80 hours: very light dirty violet	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: ruby-red, transparent	Much brighter and redder. Top liq.: colourless, clear	<i>Deep indigo-blue</i> (reddish). Op. I.: Very bluish pink, constant, clear Op. II.: Dense, Bordeaux-red precipitate. Top liq.: very faintly bluish pink Op. III.: Colourless	At first, no change. In 85 hours: completely decolorised. Res.: white (with violet tinge). Top liq.: colourless (milky)	Completely faded in 75 hours	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: deep brown-red, transparent	Brighter and browner. Top liq.: colourless	<i>Indigo-blue.</i> Op. I.: Very bluish-pink, constant, clear. Op. II.: Dense, dirty Bordeaux-red precipitate. Top liq.: pale bluish-pink Op. III.: Colourless	At first, no change. In 56 hours: completely decolorised. Res.: white. Top liq.: colourless (milky)	In 75 hours: much faded (very bright reddish grey)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
ScarletGRL (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Carmine (yellowish)	Fair	Fairly sol. (yellow- orange)	Fair	Insol.	Insol.
Brilliant acid carmine G (Oehler)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Carmoisin (reddish)	Fair	Some- what (bluish carmine)	Fair	Insol.	Insol.
Brilliant acid carmine 6 B (Oehler)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish Bordeaux	Fair	Some- what (purple- red)	Fair	Insol.	Insol.
Brilliant double scarlet 3 R (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright reddish brown	Fair	Fair (orange)	Fair	Insol.	Insol.
Benzo fast scarlet 5 BS (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright reddish carmoisins (raspberry colour)	Insol.	Insol.	Insol.	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Completely decomposed. Res. : white. Top liq. : brownish red, transparent	Much browner. Top liq. : colourless, clear	<i>Ponceau.</i> Op. I. : Pale yellowish pink, constant, clear Op. II. : Orange-red flocculent precipitate. Top liq. : Pale orange Op. III. : Pale lemon-yellow	At first, no change. In 6 days : completely decolorised. Res. : pale flesh colour. Top liq. : colourless, clear	In 75 hours : faded to a pale bluish pink	5 per cent. precipitation.
Completely decomposed. Res. : white. Top liq. : reddish brown, transparent	Much browner. Top liq. : brilliant carmine, clear	<i>Lively bluish carmoisin.</i> Op. I. : Bluish pink, constant, clear Op. II. : Bluish carmoisin solution. Res. : white (carrier) Op. III. : Colourless	At first, no change. In 5 days residue pink. Top liq. : colourless, clear. No further change	In 75 hours : fades to a very light brownish pink	5 per cent. precipitation.
Completely decomposed. Res. : white. Top liq. : deep red-brown, transparent	Somewhat brighter. Top liq. : lively brownish carmine, clear	<i>Dark brownish carmoisin.</i> Op. I. : Pale red-violet constant, clear Op. II. : Reddish violet flocculent precipitate. Top liq. : pale bluish pink Op. III. : Colourless	At first, no change. In 5 days : residue pink. Top liq. : colourless, clear. No further loss of colour	In 75 hours : much faded (dirty bluish violet)	5 per cent. precipitation.
Completely decomposed. Res. : white. Top liq. : reddish orange, transparent	Becomes more lively. Res. : reddish brown. Top liq. : brownish orange, clear	<i>Brilliant cherry-red.</i> Op. I. : Yellowish pink, constant, clear Op. II. : Scanty, brownish orange-yellow precipitate. Top liq. : orange-red Op. III. : Colourless	At first, no change. In 10 hours : completely decolorised. Res. : reddish white. Top liq. : colourless, milky	In 75 hours : completely discoloured	5 per cent. precipitation.
Partly decomposed. Res. : deep bluish carmine. Top liq. : ponceau	Yellow-brown. Top liq. : brownish orange, clear	<i>Dark carmoisin.</i> Op. I. : Fiery carmine flocculent precipitate, insoluble in water Op. II. : Carmine finely flocculent precipitate. Top liq. : colourless Op. III. : Colourless	At first, no change. In 4 days : completely decolorised. Res. : white. Top liq. : colourless, milky	In 75 hours : much faded (brownish colcothar colour)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Benzo fast scarlet 4 BS (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brownish carmoisin	Traces	Traces	Traces	Insol.	Insol.
Acid carmine B (Oehler)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish carmoisin	Fair	Some-what (bluish pink)	Fair	Insol.	Insol.
Benzo-purpurin 4 B (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Yellowish carmine	Traces (much colouring matter at first dissolves, but on cooling is precipitated in flocks)	Some-what	Insol. (becomes dark chocolate-brown)	Insol.	Insol.
Chromotrop 6 B (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Chalk ev., Soda calc., Barium chloride	Dark red-violet	Fair	Traces	Great	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Partly decomposed. Res. : carmine. Top liq. : ponceau, transparent	Brilliant red-brown. Res. : dark brownish carmoisin. Top liq. : brownish orange, clear	<i>Carmoisin</i> (fiery carmine by transmitted light). Op. I. : Carmine flocculent precipitate, insoluble in water Op. II. : Carmine finely flocculent precipitate. Top liq. : colourless Op. III. : Colourless	At first, no change. In 4 days : completely decolorised. Res. : white. Top liq. : colourless, milky	In 75 hours : discoloured (dirty reddish brown)	5 per cent. precipitation.
Completely decomposed. Res. : white. Top liq. : reddish brown, transparent	Much browner. Top liq. : ruby-red, transparent	<i>Lively carmoisin.</i> Op. I. : Very bluish pink, constant, clear. Op. II. : Clear carmine solution. Res. : white (carrier) Op. III. : Colourless	At first, no change. In 6 days : completely decolorised. Res. : very pale pink. Top liq. : colourless, clear	In 80 hours : quite faded (pale bluish pink)	5 per cent. precipitation.
No effect	Fiery carmine. Top liq. : colourless	<i>Lively Prussian-bluish.</i> Op. I. : Greenish blue flocculent precipitate, insoluble in water Op. II. : Dark dirty bluish green precipitate, which becomes brown-red with excess of NaOH. Top liq. : colourless Op. III. : Colourless	Very dark bluish grey, nearly black. In 45 minutes : completely decolorised. Res. : white. Top liq. : colourless, milky	In 70 hours : quite faded, (dirty reddish grey)	5 per cent. precipitation.
Completely decomposed. Res. : white. Top liq. : when strongly diluted becomes brilliant carmine	At first, brilliant cherry-red ; later, completely decomposed. Res. : white. Top liq. : carmine	<i>Brilliant carmoisin.</i> Op. I. : At first, red-violet, clear ; later, brighter and redder Op. II. : Clear carmine-red liquid. Res. : white (carrier) Op. III. : Colourless	At first, no change. In 10 days : completely decolorised. Res. : reddish white. Top liq. : colourless, clear	In 60 hours : very much lighter, (dirty reddish grey)	10 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol	Acetic Acid.	Turpentine.	Varnish.
Chromotrop 8 B (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Chalk ev., Soda calc., Barium chloride	Blue- violet	Fair	Insol.	Great	Insol.	Insol.
Chromotrop 10 B (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda calc., Barium chloride	Lively red- violet	Fair	Fair (ruby- red)	Great	Insol.	Insol.
Guinea red 4 R (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright bluish red	Fair	Some- what (very bluish pink, with slight greenish fluores- cence)	Somewhat	Insol.	Insol.
Columbia fast scarlet 4 B (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Carmine	Fair	Traces (reddish yellow)	Somewhat	Insol.	Insol.
Croceïn scarlet 10 B (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Purple- red	Fair	Fair (brilliant carmine)	Fair	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Completely decomposed. Res.: white. Top liq.: red-violet when strongly diluted, otherwise opaque	At first, brilliant bluish violet; later, completely decomposed. Res.: white. Top liq.: blue-violet	<i>Prussian-bluish.</i> Op. I.: At first, bluish violet; later, brighter and more reddish Op. II.: Bluish carmoisin liquid. Res.: white (carrier) Op. III.: Colourless	At first, no change. In 10 days: completely decolorised. Res.: very light bluish pink. Top liq.: colourless, clear	In 60 hours: very much lighter, and completely discoloured	10 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: bluish carmine when strongly diluted, otherwise opaque	At first, brilliant red-violet; later, decomposed, then as with NaOH 12° B.	<i>Prussian-bluish</i> (very lively). Op. I.: At first, very bluish violet; later, brighter and more reddish Op. II.: Very dark bluish violet liquid. Res.: white (carrier) Op. III.: Colourless	At first, no change. In 10 days: completely decolorised. Res.: very light reddish violet. Top liq.: colourless, clear	In 60 hours: very much brighter and redder	10 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: brilliant ponceau	Lively brown-red, partly decomposed. Top liq.: ponceau	<i>Yellowish carmine.</i> Op. I.: Very pale yellowish pink, clear, constant Op. II.: Brick-red fine precipitate. Top liq.: orange, clear Op. III.: Colourless	At first, no change. In 5 days: completely decolorised. Res.: white (with red tinge). Top liq.: colourless, clear	In 80 hours: only slightly yellowish	5 per cent. precipitation.
No effect	Very fiery carmine. Top liq.: colourless, clear	<i>Indigo-blue.</i> Op. I.: Orange-yellow, constant, clear Op. II.: Reddish brown flocculent precipitate. Top liq.: pale brownish Op. III.: Colourless	Much browner. In 5 days: completely decolorised. Res.: very pale flesh-coloured. Top liq.: colourless, clear	In 80 hours: much lighter and browner	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: red-violet, opaque	Blackish blue-violet. Top liq.: colourless, clear	<i>Deep greenish blue.</i> Op. I.: Very bluish pink, clear, constant Op. II.: Dirty red-violet dark flocculent precipitate. Top liq.: very bluish pink Op. III.: Colourless	At first, no change, In 7 days: completely decolorised. Res.: pale bluish pink. Top liq.: colourless, clear	In 65 hours: completely faded (dirty yellowish pink)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Azo-floxine 2 G (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright bluish pink	Some- what	Slight (bluish pink)	Somewhat	Insol.	Insol.
Benzo- Bordeaux- red 6 B (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish Bordeaux- red	Fair	Fair (bluish crimson)	Fair	Insol.	Insol.
Leather-red R (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish carmoisin	Fair	Fair (scarlet- red)	Fair	Insol.	Traces
Brilliant crocein 3 B conc. 20712 (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery carmine	Fair	Fair (reddish orange)	Fair	Insol.	Traces

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Completely decomposed. Res.: white. Top liq.: brownish orange, clear	At first, dark brown-orange; later, decomposed. Top liq.: carmine	<i>Ponceau.</i> Op. I.: Very pale bluish pink, constant, clear Op. II.: Dull bluish ponceau liquid. Res.: white (carrier) Op. III.: Colourless	In 5 days: completely decolorised. Res.: white. Top liq.: colourless, clear	In 75 hours: much faded	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: carmoisin, opaque	Very dark Bordeaux-red, nearly black, partly decomposed. Top liq.: red-violet, opaque	<i>Dirty greenish blue.</i> Op. I.: Bluish carmine very fine precipitate, partly soluble in water. Solution: bluish carmine Op. II.: Very dark brown-red precipitate. Top liq.: colourless Op. III.: Colourless	At first, no change. After 24 hours: completely decolorised. Res.: white. Top liq.: colourless, clear	In 65 hours: completely discoloured (dark yellowish grey)	5 per cent. precipitation.
Partly decomposed. Res.: tobacco-brown. Top liq.: brownish yellow, clear	Deep red-brown; later, somewhat greener. Top liq.: brownish yellow, clear	<i>Very brilliant yellowish green.</i> Op. I.: Yellow-orange, constant, clear Op. II.: Through red-violet to a reddish brown fine precipitate. Top liq.: red-brown, clear Op. III.: Golden-yellow (when strongly shaken)	At first, no change. In 14 days: much decolorised. Res.: dirty red-violet. Top liq.: pale reddish, clear	In 75 hours: much faded (colcothar-like coloured)	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: deep red-brown, transparent	Brilliant brownish Bordeaux-red; later, completely decomposed. Res.: white. Top liq.: deep red-brown, opaque	<i>Brilliant red-violet.</i> Op. I.: Cheesy, brown-red precipitate, which dissolves to a constant orange-coloured, clear liquid Op. II.: Dense chocolate-brown precipitate Op. III.: Colourless	In 30 minutes: completely decolorised. Res.: white. Top liq.: colourless, milky	In 75 hours: completely discoloured (very light reddish brown, dirty)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Azo-carmin in powder (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Pale bluish pink	Fair	Fair (bluish carmin)	Fair	Traces	Insol.
Pigment-red G in pulp (M. L. Br.)	Barytes	Barium chloride	Yellowish ponceau	Insol.	Fair (golden- yellow)	Insol.	Some- what	Fair (yellow)
Pigment-red B in pulp	Barytes	Barium chloride	Bluish carmin	Insol.	Fair (golden- yellow)	Traces (yellow)	Some- what	Fair (orange)
Red for lakes P in pulp (M. L. Br.)	Barytes	Barium chloride	Very fiery yellowish ponceau	Insol.	Fair (yellow- ish orange)	Fair (yellow)	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B	SnCl ₂ +HCl.		
Completely decomposed. Res: white. Top liq.: raspberry-coloured, clear	No effect	<i>Lively pure green.</i> Op. I.: Bluish pink, constant, clear Op. II.: Carmine, clear liquid. Res.: white (carrier) Op. III.: Colourless	At first, no change of shade; later, partly decomposed. After 24 hours: Res.: grey-violet. Top liq.: dark brown-red; no further change	In 75 hours: a change in the colour to about half its intensity	5 per cent. precipitation.
No effect	Much browner. Top liq.: colourless	<i>Brilliant cherry-red.</i> Op. I.: Scanty, cheesy, yellowish carmine precipitate, insoluble in water Op. II.: Scarlet-red, dense precipitate. Top liq.: colourless Op. III.: Brilliant lemon-yellow	At first, no change; only a slight loss of colour after many weeks	In 150 hours: only a little whiter (no change of colour)	5 per cent. precipitation (dry weight). [A similar lake is produced by Pigment-red H.— TRANSLATOR.]
Some colouring matter is dissolved, without any further effect	Much browner. Top liq.: colourless, clear	<i>Brilliant carmoisin.</i> Op. I.: Precipitate, first brown, later carmine; insoluble in water Op. II.: Dense, splendid vermilion-red precipitate. Top liq.: colourless Op. III.: Brilliant lemon-yellow	At first, no change. In 8 days: completely decolorised. Res.: white. Top liq.: colourless, clear	In 150 hours: a trifle paler and bluer	5 per cent. precipitation (dry weight).
Red-brown (slight metallic reflex). Top liq.: bluish fluorescence	Blue-black. Top liq.: colourless, clear	<i>Brilliant red-violet.</i> Op. I.: At first brown, later carmine precipitate; forms with water a golden-yellow solution Op. II.: Lively scarlet-red precipitate, with strong metallic reflex on the surface Op. III.: Colourless (metallic lustre)	At first, no change. Top liq.: very pale yellow. In 24 hours: completely decolorised. Res.: white. Top liq.: very pale yellowish, clear	In 150 hours: somewhat bluer, but no loss of intensity	5 per cent. precipitation (dry weight). [A similar, yellowish scarlet lake is obtained from Red for lakes C (M. L. Br.)— TRANSLATOR.]

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Brilliant red for lakes R in pulp (M. L. Br.)	Barytes	Barium chloride	Splendid carmine	Insol.	Fair (yellowish orange)	Traces (bluish pink)	Somewhat	Traces
Lithol-red R in pulp (Bad.)	Barytes	Barium chloride	Very fiery bluish carmine	Insol.	Insol.	Insol.	Insol.	Insol.
Pigment-purple A in pulp (M. L. Br.)	Barytes	Barium chloride	Lively carmine	Insol.	Fair (ponceau-red)	Insol.	Great	Great
Permanent red 6 B in pulp (Berl.)	Barytes	None	Fiery carmine	Insol.	Fair	Great	Insol.	Insol.

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.	In Direct Sunlight.	Special Remarks.
Small part of colouring matter dissolves to a yellowish orange solution ; no further effect	No effect	<i>Lively yellowish carmine.</i> Op. I. : Scanty brownish precipitate, which dissolves in water to a yellowish solution Op. II. : A slight dark brown-red precipitate separates from the carrier. Top liq. : colourless Op. III. : Splendid orange-red	At first, no change. In 5 days : completely decolorised. Res. : white. Top liq. : colourless, clear	In 150 hours : much faded (bluish pink)	5 per cent. precipitation (dry weight).
No effect	No effect	<i>Brilliant red-violet.</i> Op. I. : Yellow-orange, constant, clear Op. II. : Splendid scarlet flocculent precipitate. Top liq. : colourless Op. III. : colourless	At first, somewhat darker and browner. In 75 hours : completely decolorised. Res. : white. Top liq. : colourless, clear	In 150 hours : much faded (bluish pink) [Faster, when made with sugar of lead. — TRANSLATOR.]	5 per cent. precipitation (dry weight). [A more yellowish lake produces Lithol-red GG. — TRANSLATOR.]
No effect	No effect	<i>Brilliant carmoisin.</i> Op. I. : Carmine very fine precipitate ; partially dissolves in water, to a bluish pink solution (slight fluorescence) Op. II. : Dense brownish red precipitate. Top liq. : colourless Op. III. : Brilliant brownish orange	At first, no change. Somewhat whiter after several weeks	In 150 hours : brighter and bluer	5 per cent. precipitation (dry weight).
Very small effect. Top liq. : very pale golden-yellow	No effect	<i>Splendid carmoisin.</i> Op. I. : Cheesy, brownish red precipitate, which partly dissolves to a reddish orange solution Op. II. : Splendid carmine flocculent precipitate. Top liq. : pale orange Op. III. : Colourless	Brownish carmoisin. After 5 weeks : Res. : dull bluish pink. Top liq. : colourless, milky	In 100 hours : only a little bluer	5 per cent. precipitation. [Similar lakes are obtained from Permanent red R and Permanent red 4 B (Berl.). — TRANSLATOR.]

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Helio fast red G in pulp (Beyer)	Barytes	None	Yellowish ponceau-red	Insol.	Some-what	Fair (yellowish brown)	Insol.	Insol.
Red for lakes A 101 in pulp (Berl.)	Barytes	Barium chloride	Bluish red	Some-what	Insol.	Somewhat	Insol.	Insol.
Bordeaux-red B for lakes (Berl.)	Barytes	Barium chloride	Bordeaux-red	Insol.	Insol.	Traces	Insol.	Insol.
Autol-red GL in pulp (Bad.)	Barytes	Barium chloride	Yellowish scarlet	Insol.	Fair (reddish orange)	Insol.	Great	Great (yellow-orange)
Autol-red BGL in pulp (Bad.)	Barytes	Barium chloride	Lively yellowish scarlet	Insol.	Fair (yellowish orange)	Traces (yellow)	Fair	Great (orange)

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
No effect	No effect	<i>Prussian-bluish.</i> Op. I. : Cheesy, blue-black precipitate. Top liq. : colourless, clear Op. II. : Through brown to scarlet-red flocculent precipitate. Top liq. : pale brownish yellow Op. III. : Colourless	Much browner. In 6 days : completely decolorised. Res. : white. Top liq. : colourless, turbid	In 100 hours : a little whitish	5 per cent. precipitation.
Completely decomposed. Res. : white. Top liq. : bright ponceau-red, transparent	Much browner. Top liq. : lively carmine, clear	<i>Carmoisin.</i> Op. I. : Golden-yellow constant, clear Op. II. : Brick-red finely flocculent precipitate. Top liq. : pale brownish yellow Op. III. : Faint pink	At first, no change. In 4 hours : decolorised. Res. : white. Top liq. : colourless, turbid	In 100 hours : only a little bluer	5 per cent. precipitation.
Completely decomposed. Res. : white. Top liq. : yellowish ponceau-red, clear	Fiery carmine. Top liq. : yellowish orange, clear	<i>Splendid carmoisin.</i> Op. I. : Cheesy, brown-red precipitate ; dissolves yellowish pink Op. II. : Scarlet-red ; clear liquid Op. III. : Colourless	At first, no change. In 20 days : completely decolorised. Res. : white. Top liq. : colourless, turbid	In 100 hours : only very little bluer	5 per cent. precipitation.
No effect	Much browner. Top liq. : colourless, clear	<i>Deep red-violet.</i> Op. I. : Very fine carmine precipitate, insoluble in water Op. II. : Scarlet-red dense precipitate. Top liq. : colourless Op. III. : Brilliant yellowish orange	At first, no change. Very slightly decolorised after many weeks	In 150 hours : only very little whiter (without change of shade)	5 per cent. precipitation (dry weight).
No effect	Much browner. Top liq. : colourless, clear	<i>Brilliant cherry-red.</i> Op. I. : Cheesy precipitate, at first brown, later scarlet-red, insoluble in water Op. II. : Scarlet-red flocculent precipitate. Top liq. : colourless Op. III. : Brilliant lemon-yellow	A slight effect noticeable after some weeks	In 150 hours : about half-faded (yellowish)	5 per cent. precipitation (dry weight).

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Autol-red BL in pulp (Bad.)	Barytes	Barium chloride	Bluish carmine	Insol.	Fair (yellowish orange)	Traces (very pale yellow)	Somewhat	Great (orange)
Autol-red RLP in pulp (Bad.)	Barytes	Barium chloride	Yellowish Bordeaux-red	Insol.	Fair (ponceau-red)	Insol.	Great	Great
Autol-red RLP bluish in pulp (Bad.)	Barytes	Barium chloride	Bluish Bordeaux-red	Insol.	Fair (ponceau-red)	Insol.	Great	Great
Pigment Bordeaux-red R in pulp (M. L. Br.)	Barytes	Barium chloride	Lively reddish Bordeaux-red	Insol.	Fair (ponceau)	Insol.	Great	Great

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
No effect	Much browner. Top liq. : colourless, clear	<i>Brilliant carmoisin</i> Op. I. : At first brown, later yellowish carmine, cheesy precipitate, insoluble in water Op. II. : Dense, splendid vermilion-red precipitate. Top liq. : colourless Op. III. : Brilliant lemon-yellow	At first, no change. After 12 days : completely decolorised. Res. : white. Top liq. : colourless, clear	In 150 hours : only a little paler and bluer	5 per cent. precipitation (dry weight).
No effect	No effect	<i>Very dark blue-violet.</i> Op. I. : Very scanty brownish carmoisin fine precipitate, insoluble in water Op. II. : Brown-red fine precipitate. Top liq. : colourless Op. III. : Bright brownish orange	Only very small effect after some weeks	In 150 hours : much faded (whitish)	4 per cent. precipitation (dry weight).
No effect	No effect	<i>Indigo-blue (reddish).</i> Op. I. : A scanty, very fine brownish carmoisin precipitate, insoluble in water Op. II. : Scanty brown-red precipitate. Top liq. : colourless Op. III. : Brilliant brownish orange	After some weeks : no effect of importance	In 150 hours : much faded (whitish)	4 per cent. precipitation (dry weight).
No effect	No effect	<i>Very dark bluish violet.</i> Op. I. : Very fine, scanty, brownish carmoisin precipitate, insoluble in water Op. II. : Carmine-red fine precipitate. Top liq. : colourless Op. III. : Very brilliant brownish orange	Only slight effect produced even after several weeks	In 150 hours : much whiter	4 per cent. precipitation (dry weight).

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Pigment Bordeaux-red N in pulp (M. L. Br.)	Barytes	Barium chloride	Bluish Bordeaux-red	Insol.	Fair (ponceau)	Insol.	Great	Great
*Eosine H 7 G (Bad.)	Barytes	Nitrate or acetate of lead	Yellowish carmine	Traces	Fair (orange, with greenish fluoresc.)	Fair Res.: reddish orange. Top liq.: golden-yellow, clear	Insol.	Insol.
Eosine, yellowish, for lakes (Bad.)	Barytes	Acetate or nitrate of lead	Very bluish carmine	Insol.	Fair (yellowish pink, with greenish fluoresc.)	Completely soluble. Res.: white. Top liq.: golden-yellow	Insol.	Insol.

* New acid-eosine L (Bad.) produces a very fiery bluish carmine lake, very much faster

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
No effect	No effect	<i>Indigo-blue (reddish).</i> Op. I.: Carmoisin very fine precipitate, insoluble in water Op. II.: Fine, carmoisin precipitate. Top liq.: colourless Op. III.: Brilliant brownish orange	No effect of importance noticeable even after several weeks	In 150 hours: much whiter	4 per cent. precipitation (dry weight).
Completely decomposed. Res.: white. Top liq.: by transmitted light, after long standing, brownish carmine; by reflected light a strong greenish fluorescence is seen	At first, rather yellower; later, becomes brown. Top liq.: deep red-violet, opaque.	<i>Bright lemon-yellow.</i> Op. I.: Very pale yellowish orange, constant Op. II.: Yellowish orange-red flocculent precipitate. Top liq.: colourless Op. III.: Lemon-yellow (the colouring matter is entirely taken up by the ether so that the lowermost fluid is perfectly white)	At once, yellowish orange. Top liq.: lively lemon-yellow. No further effect noticed, even after several weeks	In 60 hours: very pale yellowish pink, nearly colourless	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: brownish carmine, with strong green fluorescence	At first, no change; later, much browner. Top liq.: bluish violet, clear	<i>Lemon-yellow.</i> Op. I.: Very pale reddish brown, nearly colourless Op. II.: Scanty, lively orange-red flocculent precipitate. Top liq.: colourless Op. III.: Lemon-yellow, inferior part white	At once, orange-yellow. Top liq.: colourless. No further effect seen even after several weeks	In 60 hours: much faded (yellowish pink)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Eosine W (Bad.)	Barytes	Acetate or nitrate of lead	Very bluish carmine	Insol.	Fair (bluish pink, with greenish fluoresc.)	Completely soluble. Res.: white. Top liq.: golden-yellow, clear	Insol.	Insol.
Eosine 442 N (Bad.)	Barytes	Acetate or nitrate of lead	Very brilliant bluish pink	Insol.	Fair (bluish pink, greenish fluoresc.)	Somewhat Res.: carmine. Top liq.: reddish golden-yellow, clear	Insol.	Insol.
Eosine A (Bad.)	Barytes	Acetate or nitrate of lead	Bluish carmine	Insol.	Fair (bluish pink, yellow fluoresc.)	Entirely soluble. Res.: white. Top liq.: golden-yellow, clear	Insol.	Insol.
Eosine AG 2 L (M. L. Br.)	Barytes	Acetate or nitrate of lead	Bluish carmine	Insol.	Fair (yellowish pink, with greenish fluoresc.)	Entirely soluble. Res.: white. Top liq.: golden-yellow, clear	Insol.	Insol.

Note.—The acetic acid solution of eosine has little or no fluorescence. After long standing the alkaline solution sulphuric acid should not be made too alkaline with NaOH,

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.	In Direct Sunlight.	Special Remarks.
Completely decomposed. Res.: white. Top liq.: brownish carmine, with greenish fluorescence	At first, no change; later, very much browner. Top liq.: bluish violet, clear	<i>Brilliant golden-yellow.</i> Op. I.: Very pale yellowish pink, nearly colourless Op. II.: Yellowish orange-red flocculent precipitate. Top liq.: colourless Op. III.: Lemon-yellow lower part, above white	At once, yellow-orange. Top liq.: colourless, clear. No further effect of importance noticeable	In 60 hours: much faded nearly colourless	5 per cent. precipitation. See footnote.
Completely decomposed. Res.: white. Top liq.: brownish carmine, with strong fluorescence	At first, no change; later, much browner. Top liq.: bluish violet, clear	<i>Brilliant golden-yellow.</i> Op. I.: Flesh-coloured fine precipitate. Top liq.: colourless Op. II.: Orange-red flocculent precipitate. Top liq.: colourless Op. III.: Golden-yellow, lower part white	At once, yellow-orange. Top liq.: colourless. No further remarkable change	In 60 hours: nearly colourless	5 per cent. precipitation. See footnote.
Completely decomposed. Res.: white. Top liq.: brownish carmine, with strong fluorescence	At first, no change; later, very much browner. Top liq.: bluish violet, clear	<i>Very bright lemon-yellow (with green tinge).</i> Op. I.: Very pale reddish, constant, clear Op. II.: Orange-yellow flocculent precipitate. Top liq.: colourless Op. III.: Pale lemon-yellow, lower part white	At once, orange-yellow. No further remarkable change, even after some weeks	In 60 hours: much faded (yellowish pink)	5 per cent. precipitation. See footnote.
Completely decomposed. Res.: white. Top liq.: brownish carmine, with strong fluorescence	At first, no change; later, dark red-brown. Top liq.: blue-violet, clear	<i>Very bright lemon-yellow.</i> Op. I.: Flesh-coloured fine precipitate. Top liq.: pale brownish Op. II.: Orange-red flocculent precipitate. Top liq.: colourless Op. III.: Reddish lemon-yellow; lower part, white	At once, yellow-orange. Top liq.: colourless. No further change, even after weeks	In 60 hours: almost colourless	5 per cent. precipitation. See footnote.

becomes darker, finally black, by reflected light, with a strong greenish fluorescence. In Op. II. the solution with as this inhibits the characteristic yellow coloration with ether.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Eosine A 5 G (M. L. Br.)	Barytes	Acetate or nitrate of lead	Yellowish carmine	Insol.	Fair (yellowish orange, with greenish fluoresc.)	Entirely soluble. Res.: white. Top liq.: golden- yellow, clear	Insol.	Insol.
Eosine BB extra (M. L. Br.)	Barytes	Nitrate of lead	Very bluish carmine	Insol.	Fair (bluish pink, with greenish fluoresc.)	Entirely soluble. Res.: white. Top liq.: golden- yellow, clear	Insol.	Insol.
Eosine extra 5 B (M. L. Br.)	Barytes	Nitrate of lead	Very bluish carmine	Insol.	Fair (bluish pink, with yellow fluoresc.)	Somewhat. Res.: carmine. Top liq.: golden- yellow, clear	Insol.	Insol.

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl	In Direct Sunlight.	Special Remarks.
Completely decomposed. Res.: white. Top liq.: brownish carmine, with strong fluorescence	At first, rather yellower; later, browner. Top liq.: brilliant red-violet, clear	<i>Bright lemon-yellow (greenish).</i> Op. I.: Very pale brownish, constant, clear Op. II.: Scanty, yellow-orange precipitate. Top liq.: colourless Op. III.: Lemon-yellow, lower part white	At once, yellowish orange. Top liq.: lemon-yellow, clear. No further remarkable change, even after weeks	In 60 hours: almost colourless	5 per cent. precipitation. See footnote on pp. 90, 91.
Completely decomposed. Res.: white. Top liq.: brownish carmine, with greenish fluorescence	Deep red-brown, after long standing. Top liq.: blue-violet, clear	<i>Golden-yellow.</i> Op. I.: Dense, flesh-coloured fine precipitate. Top liq.: pale yellowish pink, nearly colourless Op. II.: Orange-red flocculent precipitate. Top liq.: colourless Op. III.: Reddish lemon-yellow, lower part white	At once, yellow-orange. Top liq.: colourless, clear. No further change remarked	In 60 hours: much faded (yellowish pink)	5 per cent. precipitation. See footnote on pp. 90, 91.
Completely decomposed. Res.: white. Top liq.: brownish carmine, with strong green fluorescence	Deep red-brown, after long standing. Top liq.: blue-violet, clear	<i>Reddish golden-yellow.</i> Op. I.: Flesh-coloured flocculent precipitate. Top liq.: pale brownish, nearly colourless Op. II.: Lively orange-red, flocculent precipitate. Top liq.: colourless Op. III.: Brownish yellow, lower part white	At once, orange-yellow. Top liq.: colourless, clear. No further change remarked, even after some weeks	In 60 hours: much faded (very light bluish pink)	5 per cent. precipitation. See footnote on pp. 90, 91.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Erythrosine B (Cass.)	Barytes	Nitrate or acetate of lead	Brilliant bluish carmine	Traces (greenish fluoresc.)	Somewhat (bluish pink, with yellow fluoresc.)	Somewhat (yellowish orange, clear)	Insol.	Insol.
Erythrosine, yellowish (Cass.)	Barytes	Nitrate or acetate of lead	Bluish carmine	Traces (greenish fluoresc.)	Somewhat (bluish pink, yellow fluoresc.)	Somewhat (brownish yellow, clear)	Insol.	Insol.
Phloxine BA extra (M. L. Br.)	Barytes	Nitrate or acetate of lead	Fiery bluish carmine	Traces (greenish fluoresc.)	Fair (bluish red, with strong yellow fluoresc.)	The lake is partly decolorised. Top liq.: colourless	Traces	Somewhat

Note.—The alkaline solutions of erythrosine and phloxine become darker and bluer after long standing. The precipitates fluorescent. A drop of the solution with ether (Op. III.) on filter-paper immediately

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.	In Direct Sunlight.	Special Remarks.
Completely decomposed. Res.: white. Top liq.: deep brown-red, with slight greenish fluorescence (opaque)	At first, fiery carmine. Top liq.: colourless, clear. After long standing, dark bluish Bordeaux-red. Top liq.: slightly bluish, clear, with dark green fluorescence	<i>Deep brownish yellow.</i> Op. I.: Faintly reddish, nearly colourless Op. II.: Reddish yellow flocculent precipitate Op. III.: Brilliant brownish yellow	Much brighter and yellower; later, nearly brick-red. Top liq.: colourless. No further change remarked	In 60 hours: very much faded (dirty yellowish pink)	5 per cent. precipitation. See footnote.
Completely decomposed. Res.: white. Top liq.: brownish red (ruby-red), clear, transparent, greenish fluorescence	At first, fiery carmine. Top liq.: colourless, clear. Dark bluish Bordeaux-red after long standing. Top liq.: slightly dark blue, green fluorescence	<i>Golden-yellow.</i> Op. I.: Faintly reddish, nearly colourless Op. II.: Flesh-coloured flocculent precipitate. Top liq.: colourless Op. III.: Brilliant golden-yellow, lower part white	Much brighter and yellower, finally yellow-orange. No further change remarked. Top liq.: colourless, milky	In 60 hours: much faded (dirty reddish grey)	5 per cent. precipitation. See footnote.
Completely decomposed. Res.: white. Top liq.: bluish carmoisin (black by reflected light)	At first, brighter and more fiery. Top liq.: colourless, clear. After long standing, deep dark blue. Top liq.: lively blue-violet, transparent, without fluoresc.	<i>Very brownish yellow.</i> Op. I.: Very bright pink flocculent precipitate, water colourless Op. II.: Very bright pink flocculent precipitate. Top liq.: colourless Op. III.: Very bright yellowish pink, flesh-coloured, lower part white	Much whiter, finally yellowish pink. Without further change. Top liq.: colourless, milky	In 60 hours: completely discoloured (dirty yellow-red, very bright)	5 per cent. precipitation. See footnote.

obtained in Op. I. dissolve in a very large quantity of water, with the original shade of the colouring matters, sometimes colours the paper red, with shades characteristic of these colouring matters.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Phloxine BA extra O (M. L. Br.)	Barytes	Nitrate or acetate of lead	Very bluish carmine	Traces (greenish fluoresc.)	Somewhat (bluish pink, with strong fluoresc.)	Decolorised. Top liq.: colourless	Traces	Somewhat
Phloxine GA extra (M. L. Br.)	Barytes	Nitrate or acetate of lead	Very bluish carmine	Traces (greenish fluoresc.)	Fair (yellowish pink, with strong fluoresc.)	Somewhat (golden-yellow)	Traces	Somewhat
Phloxine GA extra O (M. L. Br.)	Barytes	Nitrate or acetate of lead	Very lively bluish carmine	Traces (greenish fluoresc.)	Fair (yellowish pink, with strong fluoresc.)	Somewhat (golden-yellow)	Traces	Traces

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl.	In Direct Sunlight.	Special Remarks.
Completely decomposed. Res.: white. Top liq.: bluish carmoisin (black by reflected light)	At first, brighter and more fiery. Top liq.: colourless, clear. After long standing, deep dark blue. Top liq.: lively blue-violet, transparent, without fluoresc.	<i>Brilliant brownish yellow.</i> Op. I.: Reddish white flocculent precipitate, water colourless Op. II.: Very pale pink, nearly white precipitate. Top liq.: colourless Op. III.: Very pale yellowish pink, flesh-coloured, lower part white	At once, pale pink. In 3½ days: nearly colourless. Res.: reddish white. Top liq.: colourless, milky	In 60 hours: very pale pink	5 per cent. precipitation. See footnote on pp. 94, 95.
Completely decomposed. Res.: white. Top liq.: very bluish red, transparent; by reflected light, black, with greenish fluorescence	At first, brighter and more fiery. Top liq.: colourless, clear. After long standing, dark deep blue, nearly black. Top liq.: dark blue-violet without fluorescence	<i>Golden-yellow.</i> Op. I.: Colourless, clear, later redder, with a flesh-coloured fine precipitate Op. II.: A flesh-coloured flocculent precipitate. Top liq.: colourless Op. III.: Pale brownish yellow, lower part white	At once, considerably whiter, finally yellowish orange. No further change. Top liq.: colourless, milky	In 60 hours: nearly colourless	5 per cent. precipitation. See footnote on pp. 94, 95.
Completely decomposed. Res.: white. Top liq.: bluish red, transparent; by reflected light, black-greenish fluorescence	Brighter and more fiery. Top liq.: colourless. Blue-black after long standing. Top liq.: blue-violet, without fluorescence	<i>Brilliant golden-yellow.</i> Op. I.: At first, colourless and clear, then reddish, and a pale pink precipitate formed Op. II.: Flesh-coloured fine flocculent precipitate. Top liq.: colourless Op. III.: Brownish yellow, lower part white	Yellow-orange, but no further change. Top liq.: colourless, milky	In 60 hours: almost colourless	5 per cent. precipitation. See footnote on pp. 94, 95.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Rose Bengale NTO (Bad.)	Barytes	Nitrate or acetate of lead	Bluish purple-red	Traces	Fair (bluish red, turbid)	Insol.	Insol.	Insol.
Rose Bengale TN (Bad.)	Barytes	Nitrate or acetate of lead	Purple-red	Traces	Somewhat (very bluish pink)	Partly decolorised	Insol.	Insol.
Rhodamine B (M. L. Br.)	Barytes	Alumin. sulphate, Resin soap, Zinc sulphate	Very bluish pink	Traces (yellowish fluoresc.)	Completely sol. Res.: white. Top liq.: bluish pink, with strong yellowish fluoresc.	Completely sol. Res.: white. Top liq.: bluish pink, with yellowish fluoresc.	Fair	Great
Safranine BS (Cass.)	Barytes	Tannin and antimony salt	Very lively carmine (bluish)	Fair	Fair (yellowish carmine, with slight yellow fluoresc.)	Fair (splendid carmine)	Insol.	Insol.

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.	In Direct Sunlight.	Special Remarks.
Completely decomposed. Res.: white. Top liq.: deep blue-red, clear	At first, very lively bluish carmine; later, dark red-violet. Top liq.: colourless, clear	<i>Fiery orange-red.</i> Op. I.: Cheesy, pale pink precipitate, water colourless Op. II.: Lively yellowish pink flocculent precipitate. Top liq.: colourless Op. III.: Brilliant orange, lower part white	Much brighter and yellower, finally very pale yellowish pink. No further change. Top liq.: colourless, milky	In 60 hours: very light reddish brown, dirty	5 per cent. precipitation. See footnote on pp. 94, 95.
Completely decomposed. Res.: white. Top liq.: deep bluish red, clear	Very lively bluish carmine, later red-violet. Top liq.: colourless, clear	<i>Deep brownish orange.</i> Op. I.: Colourless, constant Op. II.: Yellowish pink fine flocculent precipitate. Top liq.: colourless Op. III.: Pale brownish orange, lower part white	Much brighter and yellower, finally pale yellowish pink. No further change. Top liq.: colourless, milky	In 60 hours: very bright dirty brownish red	5 per cent. precipitation See footnote on pp. 94, 95
Some colouring matter dissolves (very bright bluish pink). Nofurther effect	At first, no change; later, somewhat darker and bluer (red-violet). Top liq.: colourless, clear	<i>Pale brownish yellow.</i> Op. I.: Very bluish pink, constant, clear Op. II.: Clear bluish pink solution. Res.: white (carrier) Op. III.: Colourless	No effect	In 25 hours: completely colourless	1 per cent. precipitation
Dark red-brown. Top liq.: pale bluish pink, clear	Much darker and browner. Top liq.: tobacco-brown, clear	<i>Very lively bluish green.</i> Op. I. Bluish pink, constant, clear Op. II.: Through blue and violet-bluish carmoisin precipitate. Top liq.: pale bluish pink Op. III.: Colourless	Much brighter and bluer. After 6 days: Res.: red-violet. Top liq.: very bluish pink	In 50 hours: brownish Bordeaux-red	3 per cent. precipitation.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Somewhat brownish, finally yellowish pink. Top liq.: colourless, clear	No effect		Much darker and browner. After 6 days: Res.: pale brownish pink. Top liq.: pale brownish pink, turbid	In 50 hours: dirty bright red-violet	3 per cent. precipitation.
Somewhat brownish. Top liq.: colourless, clear	No effect	Dark olive-green (due to the carrier); otherwise as above	Dark red-violet. After 6 days: Res.: blue-black. Top liq.: colourless, turbid	In 50 hours: dirty dark brown-red	2 per cent. precipitation
Deep red-brown. Top liq.: reddish brown, clear	Deep brown-red. Top liq.: chestnut-brown, clear	<i>Very brilliant blue-green.</i> Op. I.: Brilliant yellowish pink, constant, clear Op. II.: Through blue and violet, bluish carmoisin precipitate. Top liq.: colourless Op. III.: Colourless	Much brighter and bluer. After 6 days: Res.: red-violet. Top liq.: pale bluish pink, turbid	In 50 hours: dark brown-red	3 per cent. precipitation.
At first, no change; later, gradually brightens. Finally: Res.: pale pink. Top liq.: colourless, clear	No effect		Much darker and browner. After 6 days: Res.: pale brownish pink. Top liq.: pale brownish pink, turbid	In 50 hours: dirty red-violet	3 per cent. precipitation.
No effect	No effect	Very dark olive-green (due to the carrier); otherwise as above	Very dark red-violet. After 6 days: Res.: blue-black. Top liq.: colourless, turbid	In 50 hours: dirty dark red-violet	2 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
New Magenta O (M. L. Br.)	Barytes	Tannin and antimony salt	Very bluish Bordeaux-red	Fair	Great (ruby-red), clear	Great (ruby-red)	Insol.	Insol.
	China-clay	None	Bright Bordeaux-red	Insol.	Great (ruby-red), clear	Fair (ruby-red)	...	...
	Green-earth	None	Dark Bordeaux-red	Insol.	Somewhat (very bluish carmine)	Somewhat (bluish carmine)	...	...
Rubin-red B (M. L. Br.)	Barytes	Tannin and antimony salt	Lively Bordeaux-red	Fair	Great (brilliant bluish ponceau), turbid	Great (ruby-red)	Insol.	Insol.
	China-clay	None	Lively Bordeaux-red	Somewhat	Great (ruby-red), clear	Great (ruby-red)	...	...
	Green-earth	None	Brownish Bordeaux-red	Insol.	Fair (ruby-red), clear	Fair (yellowish carmine), clear	...	...

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Brighter and browner. Top liq.: pale brownish yellow, clear	At first, no change. After long standing, pale reddish brown. Top liq.: chestnut-brown, clear	<i>Brilliant brownish yellow.</i> Op. I.: Very bluish pink, constant, clear Op. II.: Voluminous, dark bluish carmoisin precipitate. Top liq.: colourless Op. III.: Brownish yellow (a drop on filter-paper gives a brilliant magenta spot)	Nearly black. After 2 days: Res.: chocolate-brown. Top liq.: greenish grey, turbid	In 50 hours: dark grey	3 per cent. precipitation.
Slowly becomes pale bluish pink. Top liq.: colourless, clear	Somewhat paler. Top liq.: colourless, clear		Dark red-violet. After 2 days: Res.: dirty red-violet. Top liq.: bright brownish red, turbid	In 50 hours: dark blue-violet	3 per cent. precipitation.
No effect.	No effect	Deep yellow-brown (due to the carrier); otherwise as above	Deep red-brown. After 2 days: Res.: dark red-violet. Top liq.: colourless, turbid	In 50 hours: much darker and bluer	1½ per cent. precipitation.
Deep red-brown. Top liq.: brilliant lemon-yellow, clear	At first, no change. After long standing, a lively bright rust-brown. Top liq.: yellow-brown, clear	<i>Brilliant yellow-brown.</i> Op. I.: Very bluish pink, with a brownish tinge, clear, constant Op. II.: Pale yellowish brown fine flocculent precipitate. Top liq.: brownish, turbid	Very dark reddish grey; later, completely black. Top liq.: greenish grey, turbid	In 50 hours: completely grey	3 per cent. precipitation.
Brighter and browner. Finally: reddish yellow. Top liq.: pale lemon-yellow, clear	After long standing, rust-brown. Top liq.: colourless, clear	Op. III. Brilliant lemon-yellow (a drop on filter-paper is at first yellow, later yellowish pink)	Dark red-brown; later, rather violet. Top liq.: colourless, turbid	In 50 hours: dirty blue-violet	3 per cent. precipitation.
Somewhat browner. Top liq.: very pale yellowish, clear	No effect	Deep yellow-brown (due to the carrier); otherwise as above	Dark red-brown; later, nearly black. Top liq.: colourless, turbid	In 50 hours: darker and bluer	1½ per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Rubin-red N (Berl.)	Barytes	Tannin and antimony salt	Very bluish Bordeaux-red	Fair	Great (bluish ruby-red)	Great (ruby-red)	Insol.	Insol.
	China-clay	None	Bright Bordeaux-red	Insol.	Fair (very bluish carmine)	Fair (ruby-red)	...	...
	Green-earth	None	Bluish Bordeaux-red	Insol.	Somewhat (bluish pink)	Fair (very bluish carmine)	...	...
Safranine M ₀₀₀ (Oehl.)	Barytes	Tannin and antimony salt	Fiery bluish carmine	Insol.	Fair (ponceau-red), with yellow fluoresc.	Fair (bluish carmine)	Insol.	Insol.
	China-clay	None	Dull yellowish pink	Insol.	Somewhat (yellowish carmine), with yellow fluoresc.	Fair (yellowish carmine)	...	...
	Green-earth	None	Bluish Bordeaux-red	Insol.	Very slight (bluish carmine), with yellow fluoresc.	Somewhat (bluish pink)	...	...

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Much browner. Top liq.: brilliant red-brown	After long standing, brick-red. Top liq.: reddish brown	<i>Very lively golden-yellow.</i> Op. I.: Very pale bluish pink, clear, gradually fading, but not entirely Op. II.: Through red-violet, brownish carmoisin precipitate. Top liq.: pale brownish Op. III.: Brownish yellow (on filter-paper makes brilliant magenta-red spot)	Gradually browner; later, black. Top liq.: greenish grey, turbid	In 50 hours: completely grey	3 per cent. precipitation.
After long standing, gradually decolorised. Res.: pale pink. Top liq.: colourless	No effect		Gradually becomes dirty red-violet. Top liq.: colourless, turbid	In 50 hours: dark dirty red-violet	3 per cent. precipitation.
No effect	No effect	Nearly black-brown (due to the carrier); otherwise as above	Gradually becomes black. Top liq.: colourless, turbid	In 50 hours: darker and bluer	1½ per cent. precipitation.
Gradually browner. Top liq.: yellowish brown (bright), clear	Becomes browner and darker. Top liq.: brownish red, dark, clear	<i>Very brilliant bluish green.</i> Op. I.: Yellowish pink, with slight yellow fluorescence, constant Op. II.: Through bluish violet, brownish carmoisin precipitate. Top liq.: colourless, clear Op. III.: Colourless	After 12 days: Res.: dark red-violet. Top liq.: pale carmoisin-red, turbid	In 50 hours: dark brown-red	3 per cent. precipitation.
After short time, somewhat browner. Top liq.: colourless, clear	No remarkable effect		After 2 days: much browner. Res.: pale brownish red. Top liq.: pale pink, turbid	In 50 hours: dirty red-violet	3 per cent. precipitation.
No effect	No effect	Very dark olive-green (due to the carrier); otherwise as above	At first, dark red-violet. After 2 days: blue-black. Top liq.: colourless, turbid	In 50 hours: darker and bluer	1½ per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Magenta AB powder (Bad.)	Barytes	Tannin and antimony salt	Dark bluish Bordeaux-red	Fair	Great (bluish ruby-red)	Great (bluish ruby-red)	Insol.	Insol.
	China-clay	None	Bluish Bordeaux-red	Insol.	Fair (car-moisin-red)	Fair (ruby-red)	...	...
	Green-earth	None	Bluish Bordeaux-red	Insol.	Somewhat (very bluish carmine)	Somewhat (very bluish carmine)	...	...
Magenta in powder, dark (Bad.)	Barytes	Tannin and antimony salt	Bluish Bordeaux-red	Somewhat	Great (bluish ruby-red)	Great (bluish ruby-red)	Insol.	Insol.
	China-clay	None	Bluish Bordeaux-red	Insol.	Fair (ruby-red)	Fair (ruby-red)	...	...
	Green-earth	None	Bluish Bordeaux-red	Insol.	Somewhat (very red-violet)	Somewhat (very red-violet)	...	...

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Becomes brownish. Top liq.: pale yellowish brown, clear	At first, much browner; later, brighter. Top liq.: dark brown, clear	<i>Brilliant light brownish yellow.</i> Op. I.: Very bluish pink; fades considerably, but not entirely, clear Op. II.: Brownish carmoisin-red flocculent precipitate. Top liq.: brownish, clear Op. III.: Brownish yellow; colours filter-paper a brilliant magenta	Turns red-brown immediately. After 2 days: somewhat brighter. Top liq.: greenish grey, turbid	In 50 hours: quite grey	3 per cent. precipitation.
Gradually brightens and browns. Top liq.: colourless, clear	No effect		After 2 days: Res.: dirty red-violet. Top liq.: bright brownish-red, turbid	In 50 hours: dark red-violet	3 per cent. precipitation.
No effect	No effect	Blackish brown (due to the carrier); otherwise as above	After 2 days: very dark red-violet. Top liq.: colourless, turbid	In 50 hours: dark red-violet, blackish	1½ per cent. precipitation.
Much browner. Top liq.: deep red-brown, clear	At first, dark brown-red; later, brighter and yellower. Top liq.: reddish brown, clear	<i>Deep brownish yellow.</i> Op. I.: Red-violet, clear; slowly fading, but not completely Op. II.: Brownish carmoisin-red flocculent precipitate. Top liq.: brownish, clear Op. III.: Brilliant brownish yellow (on filter-paper gives very strong magenta coloration)	After 2 days: black-brown. Top liq.: greenish grey, turbid	In 50 hours: dark grey, nearly black	3 per cent. precipitation.
Gradually becomes brighter and browner. Top liq.: colourless	No effect		After 2 days: dirty red-violet. Top liq.: bright brownish red	In 50 hours: much brighter and bluer	3 per cent. precipitation.
No effect	No effect	Blackish brown (due to the carrier); otherwise as above	After 2 days: very dark dirty red-violet. Top liq.: colourless, turbid	In 50 hours: somewhat bluer	1½ per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Tannin-heliotrope (Cass.)	Barytes	Tannin and antimony salt	Very bluish Bordeaux-red, nearly violet	Insol.	Great (ruby-red)	Great (ruby-red)	Insol.	Insol.
	China-clay	None	Rather lively bluish pink	Insol.	Fair (bluish carmine)	Great (ruby-red)	...	...
	Green-earth	None	Pale bluish Bordeaux-red	Insol.	Somewhat (very reddish violet)	Somewhat (carmine)	...	...
Rhodulin-red (Bayer)	Barytes	Tannin and antimony salt	Fiery bluish carmine	Insol.	Fair (yellowish carmine), strong yellow fluoresc.	Great (bluish red)	Insol.	Insol.
	China-clay	None	Bluish pink	Insol.	Fair (reddish orange), strong yellow fluoresc.	Fair (ruby-red)	...	...
	Green-earth	None	Very bluish Bordeaux-red	Insol.	Somewhat (bluish pink), strong yellow fluoresc.	Somewhat (very red-violet)	...	...

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Partly decomposed. Res.: dark brown-red. Top liq.: yellow-red, clear		<i>Dark bluish green.</i> Op. I.: Brilliant red-violet, clear, gradually blues Op. II.: Through blue and dark red-violet, brownish carmoisin-red very dark flocculent precipitate. Top liq.: bright ruby-red Op. III.: Beautiful, very brilliant ruby-red	Red violet. Top liq.: reddish violet, turbid	In 50 hours : red-brown	3 per cent. precipitation.
No effect			Dark bluish red. After 24 hours : red-brown. Top liq.: brownish red, turbid	In 50 hours : pale red-violet	3 per cent. precipitation.
No effect		Dark olive-green (due to the carrier); otherwise as above	Dark blue-violet. After 24 hours : blue-black. Top liq.: Very bright reddish violet, turbid.	In 50 hours : much darker, and nearly black	2 per cent. precipitation.
Dark chestnut-brown. Top liq.: very pale reddish, nearly colourless		<i>Very fiery bluish green.</i> Op. I.: Yellowish pink, constant, clear; slight yellow fluorescence Op. II.: Through blue and red-violet, dirty reddish brown fine precipitate. Top liq.: pale reddish brown Op. III.: Very brilliant brownish red, later turning to orange	Very lively red-violet; no further change. Top liq.: Red-violet, turbid	In 50 hours : red-brown	3 per cent. precipitation.
No effect			Dark brownish red. After 24 hours : red-brown. Top liq.: brownish red, turbid	In 50 hours : pale red-violet	3 per cent. precipitation.
No effect		Dark olive-green (due to the carrier); otherwise as above	Dark blue-violet. After 24 hours : blue-black. Top liq.: pale red-violet	In 50 hours : somewhat brighter and browner	2 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Brilliant rhodulin-red B (Bayer)	Barytes	Tannin and antimony salt	Fiery bluish Bordeaux-red	Insol.	Fair (yellowish carmine) strong yellow fluoresc.	Easy (ruby-red)	Insol.	Insol.
	China-clay	None	Pale brownish pink	Insol.	Fair (carmine), strong yellow fluoresc.	Great (ruby-red)	...	...
	Green-earth	None	Pale bluish Bordeaux-red	Insol.	Fair (bluish pink), very strong yellow fluoresc.	Somewhat (bluish pink)	...	...
Russia-leather-red N (Oehler)	Barytes	Tannin and antimony salt	Deep Bordeaux-red	Great	Great (ruby-red)	Great (ruby-red)	Insol.	Insol.
	China-clay	None	Brownish Bordeaux-red	Insol.	Fair (bluish carmine)	Great (ruby-red)	...	...
	Green-earth	None	Pale brownish Bordeaux-red	Insol.	Fair (bluish carmine)	Fair (ruby-red)	...	...

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Partly decomposed. Res.: tobacco-brown. Top liq.: deep reddish brown, clear		<i>Fiery dark bluish green.</i> Op. I.: Bluish pink, constant, clear; slight yellow fluorescence Op. II.: Through blue and red-violet to red-brown fine precipitate. Top liq.: pale brownish	Very lively red- violet. After 24 hours: no further change. Top liq.: red-violet, turbid	In 50 hours : red-brown	3 per cent. precipitation.
No effect		Op. III.: Brilliant bluish pink (shake well)	Dirty bluish violet. After 24 hours : dirty reddish grey. Top liq.: colourless, turbid	In 50 hours : pale red- violet	3 per cent. precipitation.
No effect		Dirty olive-green (due to the carrier) ; otherwise as above	Dark blue-violet. After 24 hours : becomes darker. Top liq.: colourless, turbid	In 50 hours : somewhat brownier	2 per cent. precipitation.
Partly decomposed. Res.: chocolate-brown. Top liq.: Deep reddish brown, clear		<i>Deep brownish yellow</i> (greenish tinge). Op. I.: Bluish pink, clear ; slowly fades, but not completely Op. II.: Reddish brown floccu- lent precipitate. Top liq.: pale brownish Op. III.: Sulphur- yellow, with strong greenish fluorescence (on filter-paper, first yellow, later orange, finally magenta- coloured)	Dark red-brown. After 24 hours : much yellower. Top liq.: ochre- coloured, turbid	In 60 hours : greenish grey	3 per cent. precipitation.
Bright reddish brown. Top liq.: colour- less, clear	No effect		Bright brownish red. After 48 hours : no change. Top liq.: ochre- coloured, turbid	In 60 hours : reddish grey	2 per cent. precipitation.
Brighter and brownier. Top liq.: colour- less, clear	No effect	Dark brown (comes from the carrier) ; otherwise as above	Dark red-brown. After 48 hours : much brighter. Top liq.: pale ochre-coloured, turbid	In 60 hours : much darker and bluer	2 per cent. precipitation.

D. VIOLET

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Cresyl fast violet 2 B (Mühl.)	Barytes	Tannin and antimony salt	Blue-violet	Insol.	Fair (blue-violet) with strong orange fluoresc.	Great (red fluoresc.)	Insol.	Insol.
	China-clay	None	Very bright red-violet	Insol.	Insol.	Traces (red fluoresc.)	...	...
	Green-earth	None	Greenish blue	Insol.	Insol.	Insol.; lake becomes black	...	...
Methyl-violet R (M. L. Br.)	Barytes	Tannin and antimony salt	Red-violet	Insol.	Great (red-violet)	Great	Insol.	Insol.
	China-clay	None	Red-violet	Insol.	Fair (red-violet)	Great	...	...
	Green-earth	None	Very dark red-violet	Insol.	Fair (red-violet)	Great	...	...

LAKES.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl.		
Partly decomposed. Res.: tobacco-brown. Top liq.: bright brownish, clear	Chocolate-brown. Top liq.: pale reddish, clear	<i>Deep red-brown.</i> Op. I.: At first, red-violet, clear; later, bluer, with a scanty red-violet precipitate having a slight red fluorescence Op. II.: Red-violet; later, brownish yellow flocculent precipitate. Top liq.: colourless; with small excess of NaOH, brownish Op. III.: Brilliant lemon-yellow	Brighter and bluer. In 6 hours: completely decolorised. Res.: white. Top liq.: yellowish green, clear	In 50 hours: much greyer	3 per cent. precipitation.
Completely decolorised. Res.: grey. Top liq.: colourless, clear	Bright brown. Top liq.: colourless, clear	Dirty brown-red (due to the carrier); otherwise as above	In 6 hours: completely decolorised. Res.: white. Top liq.: colourless, clear	In 50 hours: somewhat brighter	3 per cent. precipitation.
Completely decolorised. Top liq.: colourless, clear	Chestnut-brown. Top liq.: colourless, clear	Dirty brown-red (due to the carrier); otherwise as above	Darker and greener. In 6 hours: completely decolorised. Res.: greenish grey (carrier). Top liq.: colourless, milky	In 50 hours: somewhat greenish	1½ per cent. precipitation.
Chocolate-brown. Top liq.: reddish brown, clear	Tobacco-brown. Top liq.: pale reddish brown, clear	<i>Brilliant golden-yellow.</i> Op. I.: Red-violet, clear, gradually blues Op. II.: Through yellow-green; dirty red-violet flocculent precipitate. Top liq.: pale brownish	At once, greenish black. In 30 hours: Res.: dark blue-green. Top liq.: grass-green, clear	In 50 hours: completely grey	3 per cent. precipitation.
At first, no change; later, is gradually decolorised	No effect	Op. III.: Bright brownish yellow (on filter-paper brilliant violet)	In 30 hours: dirty reddish grey. Top liq.: nearly white, turbid	In 50 hours: completely grey	3 per cent. precipitation.
No effect	No effect	Dirty yellow-brown (due to the carrier); otherwise as above	At first, reddish black. In 30 hours: Res.: blue-black. Top liq.: colourless, milky	In 50 hours: much darker and bluer	2 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Methyl-violet 2 R (M. L. Br.)	Barytes	Tannin and antimony salt	Very reddish violet (dark)	Fair	Great (red-violet)	Great	Insol.	Insol.
	China-clay	None	Very reddish violet	Insol.	Fair (red-violet)	Great	...	...
	Green-earth	None	Very dark red-violet	Insol.	Fair (red-violet)	Great	...	...
Methyl-violet BB (M. L. Br.)	Barytes	Tannin and antimony salt	Fiery bluish violet	Traces	Great (bluish violet)	Great	Insol.	Insol.
	China-clay	None	Very lively bluish violet	Insol.	Fair (bluish violet)	Fair	...	...
	Green-earth	None	Dark bluish violet	Insol.	Fair (bluish violet)	Fair	...	...

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Partly decomposed. Res.: dirty reddish grey. Top liq.: pale yellow-brown, clear	Lively rust-brown. Top liq.: brownish, turbid	<i>Lively brownish yellow.</i> Op. I.: Through green to dark blue-violet. Finally: indigo-blue, and gradually fading Op. II.: Through yellow-green, dark green, and blue; dirty red-violet flocculent precipitate. Top liq.: colourless	Darker and bluer. In 30 hours : Res.: dark blue-green. Top liq.: grass-green, nearly yellow, clear	In 50 hours : completely grey (reddish)	3 per cent. precipitation.
Slowly decolorised	No effect	Op. III.: Bright lemon-yellow (on filter-paper brilliant red-violet)	Darker and browner. In 30 hours : Res.: reddish grey. Top liq.: colourless, milky	In 50 hours : reddish grey	3 per cent. precipitation.
No effect	No effect	Dirty yellow-brown (due to the carrier); otherwise as above	Darker and bluer. In 30 hours : Res.: black. Top liq.: colourless, turbid	In 50 hours : somewhat darker and bluer	2 per cent. precipitation.
Partly decomposed. Res.: dirty red-violet, very bright. Top liq.: yellowish brown, clear	Lively chestnut-brown. Top liq.: very pale brownish	<i>Brilliant brownish orange.</i> Op. I.: Brilliant blue-violet, clear, gradually blues Op. II.: Through yellow-green, green, blue; very red-violet flocculent precipitate. Top liq.: colourless	Dark greenish blue, nearly black. In 30 hours : Res.: bright greenish blue. Top liq.: grass-green, clear	In 50 hours : bright grey	3 per cent. precipitation.
Nearly completely decolorised	No effect	Op. III.: Brilliant reddish brown (on filter-paper brilliant blue-violet)	Reddish black. In 30 hours : Res.: reddish grey. Top liq.: colourless, milky	In 50 hours : bright reddish grey	3 per cent. precipitation.
No effect	No effect	Deep dark brown (due to the carrier); otherwise as above	Darker and bluer. In 30 hours : Res.: black. Top liq.: colourless, clear	In 50 hours : much blacker	2 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Methyl-violet BBN (M. L. Br.)	Barytes	Tannin and antimony salt	Fiery bluish violet	Traces	Great (bluish violet)	Great	Insol.	Insol.
	China-clay	None	Very lively bluish violet	Insol.	Fair (bluish violet)	Fair	...	...
	Green-earth	None	Dark bluish violet	Insol.	Fair (bluish violet)	Fair	...	...
Methylene-violet RRA (M. L. Br.)	Barytes	Tannin and antimony salt	Great (red-violet)	Insol.	Somewhat (red-violet)	Great	Insol.	Insol.
	China-clay	None	Bright red-violet	Insol.	Fair (bluish carmine)	Great	...	...
	Green-earth	None	Dark red-violet	Insol.	Somewhat (bluish pink)	Fair	...	...

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Partly decomposed. Res.: pale red-violet. Top liq.: yellowish brown, clear	Lively chestnut-brown. Top liq.: very pale brownish	<i>Brilliant brownish orange.</i> Op. I.: Blue-violet, clear; gradually blues, somewhat fading; later, blue precipitate Op. II.: Through yellow-green, green, and blue, very red-violet flocculent precipitate. Top liq.: colourless Op. III.: Brilliant reddish brown (on filter-paper gives blue-violet spots)	Dark greenish blue, nearly black. After 30 hours : Res.: bright greenish blue. Top liq.: grass-green, clear	In 50 hours : bright-grey	3 per cent. precipitation.
Nearly completely decolorised. Top liq.: colourless, clear	No effect		Reddish black. After 30 hours : Res.: reddish grey. Top liq.: colourless, milky	In 50 hours : reddish grey	3 per cent. precipitation.
No effect	No effect	Very dark brown (due to the carrier); otherwise as above	Darker and bluer. After 30 hours : Res.: black. Top liq.: colourless, milky	In 50 hours : much darker, blackish	1½ per cent. precipitation.
Partly decomposed. Res.: deep bluish carmoisin-red. Top liq.: ruby-red	Partly decomposed. Res.: red-brown. Top liq.: reddish brown, clear	<i>Lively bluish green.</i> Op. I.: Very red-violet, clear, gradually fading somewhat Op. II.: Through blue to very red-violet flocculent precipitate. Top liq.: colourless Op. III.: Brilliant ruby-red (on filter-paper magenta-red spot)	After 72 hours : very light red-violet, dirty Top liq.: colourless, turbid	In 50 hours : brownish carmoisin-red.	3 per cent. precipitation.
No effect	No effect		At first, no change. After 72 hours : completely decolorised. Res.: white. Top liq.: pale pink, turbid	In 50 hours : dirty bright red	3 per cent. precipitation.
No effect	No effect	Dirty olive-green (due to the carrier); otherwise as above	At first, no change. After 52 hours : completely decolorised. Res.: greenish grey (carrier). Top liq.: pale pink, turbid	In 50 hours : blackish violet	2 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Methylene-violet BN in powder (M. L. Br.)	Barytes	Tannin and antimony salt	Very bluish violet	Insol.	Fair (red-violet)	Great	Insol.	Insol.
	China-clay	None	Bright reddish violet	Insol.	Somewhat (red-violet)	Great	...	...
	Green-earth	None	Dark bluish violet	Insol.	Somewhat (red-violet)	Fair	...	...
Methyl-violet B extra (Bad.)	Barytes	Tannin and antimony salt	Lively dark blue-violet	Insol.	Great (bluish violet)	Great	Insol.	Insol.
	China-clay	None	Bright bluish violet	Insol.	Fair (bluish violet)	Great	...	...
	Green-earth	None	Dark blue-violet	Insol.	Fair (bluish violet)	Very sol.	...	...

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Partly decomposed. Res.: very bluish carmoisin-red. Top. liq.: ruby-red, clear	Partly decomposed. Res.: brown-red. Top liq.: red-brown, turbid	<i>Lively bluish green.</i> Op. I.: Bluish violet, clear, gradually fading somewhat Op. II.: Dark red-violet very fine precipitate. Top liq.: colourless Op. III.: Brilliant ruby-red (on filter-paper bluish magenta spot)	Considerably bluer. In 72 hours : Res.: bluish grey. Top liq.: colourless, turbid	In 50 hours : brownish carmoisin	3 per cent. precipitation.
No effect	No effect		Considerably bluer. In 72 hours : completely decolorised. Res.: white (yellowish). Top liq.: colourless, turbid	In 50 hours : dirty pink (brownish)	3 per cent. precipitation.
No effect	No effect	Dirty dark olive-green (due to the carrier) ; otherwise as above	Bluer and darker. In 52 hours : completely decolorised. Res.: greenish grey (carrier). Top liq.: colourless, turbid	In 50 hours : only somewhat redder	2 per cent. precipitation.
Bluish carmoisin-red. Top. liq.: scarcely brownish, clear	Partly decomposed. Res.: chestnut-brown. Top liq.: yellow-brown, turbid	<i>Brilliant golden-yellow.</i> Op. I.: Indigo-blue, clear, gradually fading somewhat ; blue precipitate Op. II.: Through yellow-green and green to dark blue flocculent precipitate. Top liq.: colourless	At once, greenish black. In 90 hours : Res.: pale bluish green. Top liq.: grass-green, turbid	In 50 hours : grey	3 per cent. precipitation.
No effect	No effect	Op. III.: Brilliant yellow-brown (on filter-paper red-violet spot)	In 72 hours : Res.: Dirty grey-green. Top liq.: pale greenish yellow, turbid	In 50 hours : bright grey	3 per cent. precipitation.
No effect	No effect	Dark yellowish brown (from the carrier) ; otherwise as above	Blue-black. In 72 hours : Res.: bluish grey. Top liq.: colourless, turbid	In 50 hours : more blackish	1½ per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Rhodulin-violet (Bayer)	Barytes	Tannin and antimony salt	Dark red-violet	Insol.	Somewhat (red-violet), red fluoresc.	Great	Insol.	Insol.
	China-clay	None	Very light reddish violet	Insol.	Somewhat (red fluoresc.)	Fair	...	...
	Green-earth	None	Pale red-violet	Insol.	Traces (red fluoresc.)	Traces	...	...
Rhodulin-heliotrope (Bayer)	Barytes	Tannin and antimony salt	Dark blue-violet	Traces	Great (red-violet)	Great	Insol.	Insol.
	China-clay	None	Very reddish violet (bright)	Insol.	Fair (red-violet)	Fair	...	...
	Green-earth	None	Dull red-violet	Insol.	Somewhat (red-violet)	Traces	...	...
Formyl-violet S 4 B (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery blue-violet	Insol.	Fair (bluish violet)	Fair	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Partly decomposed. Res.: dark brown-red. Top liq.: very bluish carmine	Partly decomposed. Res.: dark brown-red. Top liq.: dark ruby-red, clear	<i>Dark bluish green.</i> Op. I.: Very red-violet, clear, gradually fading somewhat Op. II.: Deep bluish Bordeaux-red very fine precipitate. Top liq.: brown-red, clear	No remarkable effect	In 50 hours: dark carmoisin-red, brownish	3 per cent. precipitation.
No effect	No effect	Op. III.: Brilliant ruby-red (on filter-paper magenta)	In 6 days: Res.: dirty red-violet. Top liq.: pale red-violet, turbid	In 50 hours: reddish grey	3 per cent. precipitation.
No effect	No effect	Dirty olive-green (due to the carrier); otherwise as above	In 6 days: Res.: reddish grey. Top liq.: colourless, milky	In 50 hours: somewhat greyer	2 per cent. precipitation.
Black. Top liq.: colourless, clear	Black. Top liq.: colourless, clear	<i>Blackish olive-green.</i> Op. I.: Very red-violet, clear, fading somewhat Op. II.: Very dark red-violet flocculent precipitate. Top liq.: colourless	No remarkable effect	In 60 hours: brighter and greyer	3 per cent. precipitation.
No effect	No effect	Op. III.: Very brilliant red-violet	After 6 days: dirty red-violet. Top liq.: pale pink, turbid	In 60 hours: much brighter and greyer	3 per cent. precipitation.
No effect	No effect	Greenish black (due to the carrier); otherwise as above	After 6 days: Res.: dark red-violet. Top liq.: colourless, milky	In 60 hours: somewhat brighter	2 per cent. precipitation.
Somewhat brighter; no further effect. Top liq.: colourless, clear	After 12 hours. Res.: dirty reddish grey. Top liq.: colourless, clear	<i>Lively yellow-brown.</i> Op. I.: Bright blue, clear. In a few hours colourless Op. II.: Bright blue fine precipitate. Top liq.: colourless Op. III.: Colourless	Much bluer. In 60 hours: completely decolorised. Res.: white. Top liq.: pale bluish violet, turbid	In 40 hours: colourless	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Fast acid-violet A 2 R (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bluish pink	Insol.	Fair (bluish carmine)	Fair	Insol.	Insol.
Fast acid violet RO (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very bluish pink	Insol.	Fair (bluish carmine)	Fair	Insol.	Insol.
Fast acid violet B (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Red-violet	Insol.	Some- what (red- violet)	Great	Insol.	Insol.
Acid violet 6 BN (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Pale blue- violet	Fair	Fair (very bluish violet)	Fair	Insol.	Insol.
Acid violet 4 R (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brilliant bluish pink	Insol.	Some- what (yellow- ish pink)	Fair	Insol.	Insol.
Acid violet 3 RA (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Pale red- violet	Some- what	Fair (red- violet)	Fair	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Completely decomposed. Res.: white. Top liq.: deep ruby-red, clear	Small effect. Res.: Deep carmoisin-red. Top liq.: very pale pink, clear	<i>Brown-red.</i> Op. I.: Bluish pink, constant, clear Op. II.: Very red-violet fine flocculent precipitate. Top liq.: pale pink Op. III.: Colourless	At first, no change. Top liq.: red-violet, turbid. After 120 hours: no remarkable effect	In 40 hours: very much brighter	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: deep ruby-red, clear	Small effect. Res.: deep carmoisin red. Top liq.: colourless, clear	<i>Brown-red.</i> Op. I.: Bluish pink, constant, clear Op. II.: Red-violet flocculent precipitate. Top liq.: nearly colourless. Op. III.: Colourless	No change. Top liq.: red-violet, turbid. In 120 hours: no remarkable change	In 40 hours: very bright bluish pink	5 per cent. precipitation.
Partly decomposed. Res.: bright red-violet, opaque	Very dark carmoisin, nearly black. Top liq.: pale red-violet, turbid	<i>Brilliant brownish Bordeaux-red.</i> Op. I.: Reddish violet, constant, clear Op. II.: Dark violet flocculent precipitate. Top liq.: colourless Op. III.: Colourless	Somewhat bluer. Top liq.: red-violet, turbid No further change	In 40 hours: bright bluish pink	5 per cent. precipitation.
Very much brighter. Top liq.: colourless, clear	After long standing, dirty red-violet. Top liq.: colourless, clear	<i>Lively red-brown.</i> Op. I.: Indigo-blue, turbid, constant Op. II.: At first, indigo-blue, later blue-violet, flocculent precipitate. Top liq.: colourless Op. III.: Colourless	At first, no change. In 60 hours: completely decolorised. Res.: white. Top liq.: pale bluish violet, turbid	In 40 hours: bluish grey	5 per cent. precipitation.
Partly decomposed. Res.: very bright bluish pink. Top liq.: ruby-red, clear	More brilliant. Res.: deep carmoisin-red. Top liq.: very reddish violet, clear	<i>Brilliant brown-red.</i> Op. I.: Bluish pink, constant, clear Op. II.: Red-violet flocculent precipitate. Top liq.: colourless Op. III.: Colourless	At first, no change. Top liq.: pale red-violet. After 120 hours: no further change	In 40 hours: very bright pink	5 per cent. precipitation.
Very much brighter and whiter. Top liq.: colourless, clear	After some standing, strongly decolorised. Res.: very bright pink. Top liq.: pale pink, clear	<i>Brownish orange.</i> Op. I.: Yellowish pink, constant, clear Op. II.: Scanty blue-violet fine flocculent precipitate. Top liq.: brilliant carmine Op. III.: Colourless	At first, no change. In 120 hours: partly decolorised. Res.: pale pink-red nearly white. Top liq.: lively red-violet turbid	In 40 hours: very bright bluish pink	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Acid violet N (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very fiery violet	Great	Fair (red- violet)	Fair	Insol.	Insol.
Guinea-violet 4 B (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very fiery violet	Insol.	Some- what (blue- violet)	Fair	Insol.	Insol.
Violet for lakes R (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Pale red- violet	Insol.	Insol.	Insol.	Insol.	Insol.
Helio-violet RL (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very dark violet	Great	Insol.	Fair	Insol.	Insol.
Benzo fast violet R (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Brownish Bordeaux- red	Insol.	Fair (bluish carmine- red)	Fair	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl.		
Somewhat brighter. Top liq. : colourless, clear	Rather strongly decolorised. Res. : dirty violet (bright). Top liq. : colourless, clear	<i>Brownish orange.</i> Op. I. : Indigo-blue, clear, gradually fading Op. II. : Flocculent pale bluish violet precipitate. Top liq. : colourless Op. III. : Colourless	Much bluer. In 75 hours : completely decolorised. Res. : white. Top liq. : pale red-violet, turbid	In 40 hours : bluish grey	5 per cent. precipitation.
Somewhat brighter. Top liq. : colourless, clear	After long standing : Res. : dirty reddish grey. Top liq. : colourless, turbid	<i>Brownish orange.</i> Op. I. : Indigo-blue, clear, gradually fading Op. II. : Bright bluish violet very fine precipitate. Top liq. : pale violet-red Op. III. : Colourless	Much bluer. In 66 hours : completely decolorised. Res. : white. Top liq. : pale bluish violet, turbid	In 40 hours : bluish grey	5 per cent. precipitation.
Pale bluish pink. Top liq. : pale yellowish pink, clear	Speedily a lively carmine. Top liq. : colourless, clear	<i>Fiery carmine-red.</i> Op. I. : Pale yellowish pink - red, constant, clear Op. II. : Lively raspberry-coloured flocculent precipitate. Top liq. : colourless Op. III. : Colourless	At first, no change. In 75 hours : completely decolorised. Res. : very pale pink, nearly white. Top liq. : pale yellowish pink, turbid	In 40 hours : very bright bluish pink	5 per cent. precipitation.
Partly decomposed. Res. : dirty red-violet (bright). Top liq. : ruby-red, opaque	Deep Bordeaux-red. Top liq. : colourless, clear	<i>Dirty greenish blue.</i> Op. I. : Dark red-violet, constant, clear Op. II. : Dirty red-violet fine precipitate. Top liq. : ruby red Op. III. : Colourless	At first, no change. In 66 hours : completely decolorised. Res. : pale pink. Top liq. : colourless, turbid	In 40 hours : somewhat brighter and redder	5 per cent. precipitation.
No remarkable change	Gradually becomes chocolate-brown. Top liq. : colourless, clear	<i>Dirty blue.</i> Op. I. : Pale violet-red, turbid Op. II. : Dark brownish red finely flocculent precipitate. Top liq. : colourless Op. III. : Colourless	In 24 hours : completely decolorised. Res. : white. Top liq. : pale reddish, turbid	In 40 hours : much brighter and browner	5 per cent. precipitation.

E. BLUE

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Blue for lakes CB (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Greenish blue (light)	Some- what	Some- what (greenish blue)	Fair	Insol.	Insol.
Cotton-blue O (water- soluble) (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively ultra- marine- blue	Insol.	Insol.	Fair	Insol.	Insol.
Opal-blue, greenish (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery ultra- marine- blue (dark)	Insol.	Fair	Fair	Insol.	Insol.
Opal-blue, reddish (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Ultra- marine- blue, reddish (very lively)	Insol.	Fair	Fair	Insol.	Insol.

LAKES.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SuCl ₂ + HCl.		
Partly decolorised. Res.: pale greenish blue. Top liq.: pale carmoisin-red, clear	Completely decolorised. Res.: grey, nearly white. Top liq.: colourless, clear	<i>Pale greenish yellow.</i> Op. I.: Pale greenish blue, constant, clear Op. II.: Scanty, greenish blue finely flocculent precipitate. Top liq.: brilliant greenish blue Op. III.: Colourless	At once, yellow-green. After 15 days : Res.: bluish grey. Top liq.: pale yellowish green, turbid	In 35 hours : very bright grey, nearly colourless	5 per cent. precipitation.
Completely decolorised. Res.: brownish red. Top liq.: colourless, clear	Red-brown. Top liq.: brownish red, clear	<i>Brilliant red-brown.</i> Op. I.: Lively Prussian blue, constant, clear Op. II.: Bluish white flocculent precipitate. Top liq.: pale blue, clear Op. III.: Colourless	After 15 days : no remarkable change. Top liq.: pale red-violet, clear	In 35 hours : blue-green	5 per cent. precipitation.
Completely decolorised. Res.: very dark red-brown. Top liq.: brownish carmoisin-red, turbid	Chocolate-brown. Top liq.: pale brownish pink, clear	<i>Brilliant brown-red.</i> Op. I.: First, lively blue, clear; later is partially precipitated Op. II.: Ultramarine-blue dark flocculent precipitate. Top liq.: colourless Op. III.: Colourless	After 15 days : no remarkable change. Top liq.: very pale red-violet, turbid	In 75 hours : dark bluish grey	5 per cent. precipitation.
Completely decolorised. Res.: red-brown. Top liq.: carmoisin-red, clear	Colcothar-like coloured. Top liq.: pale pink, clear	<i>Lively brownish red.</i> Op. I.: Faint blue, later a partial bright blue precipitate Op. II.: Dark, ultramarine-blue flocculent precipitate. Top liq.: colourless Op. III.: Colourless	After 15 days : no remarkable change. Top liq.: very pale red-violet, turbid	In 75 hours : much brighter and greyer	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Opal-blue, bluish (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery ultramarine-blue (bluish)	Insol.	Somewhat	Fair	Insol.	Insol.
Dianil blue G (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Indigo-blue	Insol.	Insol.	Somewhat	Insol.	Insol.
Dianil blue B (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark reddish blue	Insol.	Insol.	Traces	Insol.	Insol.
Pure blue O (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright ultramarine, greenish	Insol.	Insol.	Fair	Insol.	Insol.
Alkali-blue 6 (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark ultramarine-blue	Insol.	Fair	Fair	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Completely decolorised. Res.: dirty brown-red. Top liq.: brownish carmoisin-red, turbid	Colcothar-like coloured. Top liq.: pale pink, clear	<i>Brilliant red-brown.</i> Op. I.: Very dark blue, clear, later partially precipitated Op. II.: Very dark ultramarine-blue flocculent precipitate. Top liq.: pale blue Op. III.: Colourless	After 15 days: no remarkable change. Top liq.: very pale pink, turbid	In 75 hours: much brighter and greyer	5 per cent. precipitation.
Partly decomposed. Res.: dark blue-violet. Top liq.: very dark red-violet, opaque	Partly decomposed. Res.: dark violet. Top liq.: dark blue-violet, opaque	<i>Very dark greenish blue.</i> Op. I.: Dark blue, constant, clear Op. II.: Partial reddish blue precipitate. Top liq.: deep reddish blue Op. III.: Colourless	In 15 days: completely decolorised. Res.: bluish grey. Top liq.: colourless, clear	In 75 hours: bright reddish grey	5 per cent. precipitation.
Partly decomposed. Res.: dark blue-violet. Top liq.: very dark ruby-red, transparent	Partly decomposed. Res.: dark red-violet. Top liq.: red-violet, opaque	<i>Very dark greenish blue.</i> Op. I.: Reddish blue, constant, clear Op. II.: Reddish blue dark flocculent precipitate. Top liq.: red-violet Op. III.: Colourless	In 15 days: completely decolorised. Res.: reddish grey. Top liq.: colourless, clear	In 75 hours: bright reddish grey	5 per cent. precipitation.
Bright brown-red. A little later: Res.: dirty red. Top liq.: colourless, clear	Partly decomposed. Res.: brick-red. Top liq.: yellow-red, clear	<i>Brilliant brownish red.</i> Op. I.: Pure blue, clear; later, a scanty bright blue precipitate Op. II.: A beautiful blue finely flocculent precipitate. Top liq.: pale blue, clear Op. III.: Colourless	In 15 days: no remarkable change. Top liq.: red-violet, clear	In 75 hours: very bright bluish grey	5 per cent. precipitation.
After a short standing, dark chocolate-brown. Top liq.: colourless, clear	Colcothar-like coloured. Top liq.: colourless, clear	<i>Nearly blood-red (brownish).</i> Op. I.: Scanty blue precipitate Op. II.: Dark blue flocculent precipitate. Top liq.: colourless Op. III.: Colourless	In 15 days: no effect	In 75 hours: blackish blue	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Alkali-blue 7 (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Ultra- marine- blue (dark)	Insol.	Fair	Fair	Insol.	Insol.
Alkali-blue R (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark ultra- marine- blue (reddish)	Insol.	Fair	Great	Insol.	Insol.
Patent blue A (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively greenish blue (bright)	Some- what	Fair (greenish blue)	Fair	Insol.	Insol.
Patent blue L (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very fiery greenish blue (sky- blue)	Fair	Fair	Fair. Res.: bluish green. Top liq.: dark green, turbid	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
After a short standing, dark red-violet. Top liq.: colourless, clear	Colcothar-like coloured. Top liq.: colourless, clear	<i>Lively brownish red.</i> Op. I.: Partial dark blue precipitate Op. II.: Dark reddish blue precipitate. Top liq.: colourless Op. III.: Colourless	After 15 days : no effect	In 75 hours : dark greenish blue	5 per cent. precipitation.
After a short standing, chocolate-brown. Top liq.: colourless, clear	Dirty red-brown. Top liq.: colourless, clear	<i>Brilliant brownish red.</i> Op. I.: Partial blue precipitate Op. II.: Dark ultramarine-blue finely flocculent precipitate. Top liq.: colourless Op. III.: Colourless	After 15 days : no perceptible action	In 75 hours : dark greenish blue	5 per cent. precipitation.
Greener. Res.: bluish green. Top liq.: pale red-violet, clear	After long standing : Res.: dirty red-violet. Top liq.: colourless, clear	<i>Discoloured (reddish grey).</i> Op. I.: Through yellow, greenish blue, constant, clear Op. II.: Through yellow and green, partial pale greenish blue precipitate. Top liq.: brilliant greenish blue Op. III.: Colourless	At once : greener. After 6 days : Res.: pale greenish blue, nearly white. Top liq.: pale greenish blue, turbid	In 40 hours : light blue, nearly colourless	5 per cent. precipitation.
Partly decomposed. Res.: bright greenish blue. Top liq.: brilliant bluish violet, clear	After long standing : Res.: pale greenish blue. Top liq.: colourless, clear	<i>Discoloured (reddish grey).</i> Op. I.: Through yellow, pale yellowish green, constant, clear Op. II.: Through yellow and green, partial white precipitate. Top liq.: brilliant greenish blue Op. III.: Colourless	At once : yellow-green. After 6 days : Res.: white. Top liq.: pale bluish, turbid	In 75 hours : light greenish grey, but fairly lively	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Water-blue R (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very reddish ultra- marine- blue (dark)	Insol.	Fair	Great	Insol.	Insol.
Alkali-blue B extra (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright ultra- marine- blue (bluish)	Insol.	Great	Great	Insol.	Insol.
Alkali-blue 6 B (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very bluish ultra- marine- blue	Insol.	Great	Great	Insol.	Insol.
Alkali-blue 5 R (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish ultra- marine- blue (dark)	Insol.	Great	Great	Insol.	Insol.
Blue for lakes I (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright ultra- marine- blue	Insol.	Fair	Great	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
After some standing : Res.: bright chocolate-brown. Top liq.: pale brownish red, clear	Colcothar-like coloured. Top liq.: colourless, clear	<i>Brilliant red-brown.</i> Op. I.: Brilliant reddish blue. At first, clear ; later partial reddish deep blue precipitate Op. II.: Voluminous dark reddish blue precipitate Top liq.: colourless Op. III.: Colourless	After 15 days : no perceptible effect.	In 75 hours : dark bluish grey	5 per cent. precipitation.
Bluish colcothar-like coloured. Top liq.: colourless, clear	Chocolate-brown. Top liq.: colourless, clear	<i>Brilliant brownish red.</i> Op. I.: A partial dark blue precipitate Op. II.: Dark blue flocculent precipitate. Top liq.: colourless Op. III.: Colourless	No effect	In 75 hours : bluish grey	5 per cent. precipitation
Brownish red, dark. Top liq.: colourless, clear	Deep brown-red. Top liq.: colourless, clear	<i>Lively brown-red.</i> Op. I.: A partial bright blue precipitate Op. II. Lively blue flocculent precipitate. Top liq.: colourless Op. III.: Colourless	No effect	In 75 hours : darker and greener	5 per cent. precipitation
Dirty reddish grey. Top liq.: colourless, grey	Dark brown-red Top liq.: colourless, clear	<i>Lively brownish-red.</i> Op. I.: Partial bluish violet precipitate Op. II.: Reddish blue flocculent precipitate. Top liq.: colourless Op. III.: Colourless	No perceptible effect	In 40 hours : dark blue-grey	5 per cent. precipitation.
Chocolate-brown. Top liq.: brown-red, turbid	Lively brownish carmoisin-red Top liq.: colourless, clear	<i>Deep brownish red.</i> Op. I.: Reddish blue. At first, clear ; later, a partial bright blue precipitate Op. II.: Dark reddish blue flocculent precipitate. Top liq.: colourless Op. III.: Colourless	No effect	In 75 hours : bluish grey	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Neptune-blue B (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively greenish blue (bright)	Traces	Some- what	Great	Insol.	Insol.
Alkali-blue for printing ink (Bad.)	{ Barytes, artif. Barytes, Alumina	...	Pale reddish blue	Insol.	Great	Great	Insol.	Insol.
Wool-blue BB (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively ultra- marine- blue	Insol.	Fair	Great	Insol.	Insol.
Wool-blue 5 B (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Ultra- marine- blue (very lively)	Insol.	Fair	Great	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
No change of colour. Top liq.: pale bluish pink	Decolorised. Res.: bright bluish grey. Top liq.: pale pink, nearly colourless	<i>Discoloured (yellowish grey).</i> Op. I.: Greenish blue, constant, clear Op. II.: Through yellow and green, greenish blue precipitate. Top liq.: brilliant greenish blue Op. III.: Colourless	Lively grass-green. After 10 days : Res.: pale greenish blue. Top liq.: bluish green, turbid	In 40 hours : almost completely decolorised (light grey)	5 per cent. precipitation.
Bright reddish grey. Top liq.: colourless, clear	Brick-red. Top liq.: colourless, clear	<i>Brown-red.</i> Op. I.: Partial reddish blue precipitate Op. II.: Reddish blue flocculent precipitate. Top liq.: colourless Op. III. Colourless	No remarkable effect	In 75 hours : bluish grey	5 per cent. precipitation.
Dull greenish blue. Top liq.: colourless, clear	Completely decolorised. Res.: dirty bright grey Top liq.: colourless, clear	<i>Dirty olive green, later brilliant brownish yellow.</i> Op. I.: Very pale reddish blue, clear ; later, partial reddish blue precipitate Op. II.: Flocculent dark blue precipitate. Top liq.: colourless Op. III.: Colourless	In 20 days : nearly completely decolorised. Res.: dirty reddish blue, nearly white. Top liq.: pale blue, turbid	In 35 hours : completely colourless (bright grey)	5 per cent. precipitation.
Dull greenish blue. Top liq.: colourless, clear	Completely decolorised. Res.: dirty yellowish grey Top liq.: colourless, clear	<i>At first olive green, later brownish yellow.</i> Op. I. Very greenish blue, pale, clear ; later, partly precipitated Op. II.: Bright greenish blue flocculent precipitate. Top liq.: colourless Op. III.: Colourless	Much greener. In 10 days : decolorised. Res.: nearly white (bluish). Top liq.: pale bluish, turbid	In 35 hours : completely colourless (bright grey)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Wool-blue R (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish ultra- marine- blue (dark)	Insol.	Great	Great	Insol.	Insol.
Helio fast blue BL (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Greenish blue (fairly bright)	Insol.	Traces	Somewhat	Insol.	Insol.
Helio fast blue SL (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Greenish blue (dark)	Insol.	Traces	Somewhat	Insol.	Insol.
Benzo fast blue BN (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish black-blue	Insol.	Insol.	Traces	Insol.	Insol.
Benzo fast blue 5 R (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark red-violet	Insol.	Insol.	Insol.	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Dull reddish blue. Top liq.: colourless, turbid	Completely decolorised. Res.: dark reddish grey. Top liq.: colourless, clear	<i>Brilliant yellowish brown.</i> Op. I.: Brilliant reddish blue, clear; later, a partial reddish blue precipitate Op. II.: Lively blue flocculent precipitate. Top liq.: colourless Op. III.: Colourless	In 20 days: completely decolorised. Res.: dirty reddish grey. Top liq.: pale reddish blue, turbid	In 35 hours: completely decolorised	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: brilliant reddish blue, clear	Dark reddish blue. Top liq.: bluish, nearly colourless	<i>Through yellow-green, sulphur-yellow.</i> Op. I.: Pale reddish blue, constant, turbid Op. II.: Reddish blue, pale, fine precipitate. Top liq.: colourless Op. III.: Colourless	In 3 hours: completely decolorised. Res.: white. Top liq.: golden-yellow, turbid	In 75 hours: only a little greener	5 per cent. precipitation.
Dark red-violet. Top liq.: colourless, clear	Dark red-violet. Top liq.: pale bluish	<i>Greenish yellow.</i> Op. I.: Red-violet fine precipitate. Top liq.: colourless Op. II.: Red-violet flocculent precipitate. Top liq.: colourless Op. III.: Colourless	In 48 hours: completely decolorised. Res.: pale reddish grey. Top liq.: brownish yellow, turbid	In 75 hours: only slightly greener	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: deep black, opaque	No remarkable effect	<i>Blue-black.</i> Op. I.: Red-violet fine precipitate. Top liq.: colourless Op. II.: Dirty red-violet dark flocculent precipitate. Top liq.: colourless Op. III.: Colourless	In 60 hours: completely decolorised. Res.: bluish grey. Top liq.: colourless, milky	In 40 hours: much brighter and redder	5 per cent. precipitation.
Red-brown. Top liq.: colourless, clear	Red-brown. Top liq.: colourless, clear	<i>Blackish green.</i> Op. I.: Cheesy, carmoisin-red precipitate. Top liq.: colourless Op. II.: Flocculent brownish carmoisin-red. Top liq.: colourless Op. III.: Colourless	In 72 hours: completely decolorised. Res.: pale pink. Top liq.: dirty red-violet, turbid	In 40 hours: much brighter and redder	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Helio-azurin RL (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark reddish blue	Insol.	Insol.	Insol.	Insol.	Insol.
Brilliant azurin B (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Reddish blue	Insol.	Insol.	Insol.	Insol.	Insol.
Helio-azurin BL (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark blue	Insol.	Insol.	Insol.	Insol.	Insol.
Brilliant azurin 5 G (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Greenish blue	Insol.	Insol.	Insol.	Insol.	Insol.
Benzo-azurin G (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very reddish blue	Insol.	Insol.	Insol.	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Partly decomposed. Res.: bluish carmoisin. Top liq.: ruby-red, clear	Brownish carmoisin. Top liq.: lively carmine, clear	<i>Indigo-blue.</i> Op. I.: Deep blue, clear, later partly precipitated Op. II.: Very dark red-violet flocculent precipitate. Top liq.: pale pink Op. III.: Colourless.	In 72 hours: completely decolorised. Res.: pale pink. Top liq.: dirty red-violet, turbid	In 40 hours: very much brighter and redder	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: deep ruby-red, clear	Bluish carmoisin-red. Top liq.: pale pink, clear	<i>Deep greenish blue, nearly black.</i> Op. I.: Brilliant red-violet, turbid, later partly precipitated Op. II.: Dark red-violet flocculent precipitate. Top liq.: colourless Op. III.: Colourless	In 24 hours: completely decolorised. Res.: white. Top liq.: pale bluish violet, turbid	In 40 hours: very much brighter and redder	5 per cent. precipitation.
Deep purple-red. Top liq.: pale pink, clear	Dark red-violet. Top liq.: colourless, clear	<i>Very dark blue-green.</i> Op. I.: Indigo-blue, constant, clear Op. II.: Blue-violet flocculent precipitate. Top liq.: colourless Op. III.: Colourless	In 72 hours: completely decolorised. Res.: dirty grey. Top liq.: very pale reddish violet, milky	In 40 hours: much brighter	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: deep red-violet, opaque	Completely decomposed. Res.: white. Top liq.: black-blue, opaque	<i>Dark dirty greenish blue.</i> Op. I.: Reddish violet very fine precipitate Op. II.: Pale bluish violet finely flocculent precipitate. Top liq.: colourless Op. III.: Colourless	In 2 hours: completely decolorised. Res.: white. Top liq.: colourless, milky	In 40 hours: much discoloured; reddish grey	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: splendid carmine, clear	Dark red-violet. Top liq.: colourless, clear	<i>Dark greenish blue.</i> Op. I.: Cheesy, dark greenish blue precipitate. Top liq.: colourless, clear Op. II.: Dark reddish violet flocculent precipitate. Top liq.: colourless Op. III.: Colourless	In 5 hours: completely decolorised. Res.: white. Top liq.: pale red-violet, turbid	In 40 hours: very bright red-violet	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Benzo-chrome-black-blue B (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Black-blue	Insol.	Insol.	Insol.	Insol.	Insol.
Brilliant benzo-blue 6 B (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Greenish blue	Insol.	Insol.	Fair	Insol.	Insol.
Benzo pure blue (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark greenish blue	Insol.	Insol.	Insol.	Insol.	Insol.
Wool-blue N (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Pure ultra-marine-blue	Fair	Somewhat	Fair	Insol.	Insol.
New patent blue GA (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright greenish blue	Somewhat	Traces	Fair	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl		
Completely decomposed. Res.: white. Top liq.: blackish red-violet, opaque	Partly decomposed. Res.: black-blue. Top liq.: blue-black, opaque	<i>Dark black-blue.</i> Op. I.: Very dark dull reddish violet fine precipitate Op. II.: Blackish red-violet flocculent precipitate. Top liq.: colourless Op. III.: Colourless	In 6 hours: completely decolorised. Res.: reddish grey. Top liq.: pale reddish, turbid	In 40 hours: reddish grey (very much brighter)	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: bluish violet, clear	Completely decomposed. Res.: white. Top liq.: lively bluish violet, clear	<i>Dull greenish blue (dark).</i> Op. I.: Pale greenish blue, constant, clear Op. II.: Ultramarine-blue very fine precipitate. Top liq.: colourless Op. III.: Colourless	In 10 minutes: completely decolorised. Res.: white. Top liq.: very pale bluish, milky	In 40 hours: completely colourless (very bright grey)	5 per cent. precipitation.
Partly decomposed. Res.: black-blue. Top liq.: red-violet, opaque	Completely decomposed. Res.: white. Top liq.: deep blue-violet, opaque	<i>Blackish greenish blue.</i> Op. I.: Lively blue; later a scanty, greenish blue precipitate Op. II.: Scanty, dull blue precipitate. Top liq.: Brilliant red-violet, clear Op. III.: Colourless	In 9 days: completely decolorised. Res.: white. Top liq.: pale bluish, turbid	In 40 hours: much brighter and redder	5 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: deep red-violet, clear	Blackish red-violet. Top liq.: colourless, clear	<i>Fairly lively crimson.</i> Op. I.: Lively greenish blue, constant, clear Op. II.: Ultramarine-blue flocculent precipitate. Top liq.: colourless Op. III.: Colourless	In 48 hours: Res.: blue-green. Top liq.: Brilliant green, clear; no further change perceptible	In 40 hours: much brighter and greener	5 per cent. precipitation.
Partly decomposed. Res.: greenish blue. Top liq.: bluish ruby-red, clear	Somewhat more bluish. Top liq.: light reddish brown, clear	<i>Yellowish grey.</i> Op. I.: Through yellow, very light greenish blue, somewhat turbid, constant Op. II.: Greenish blue liquid. Res.: white (carrier) Op. III.: Colourless	Yellowish green. In 10 days: completely decolorised. Res.: white. Top liq.: pale greenish blue, turbid	In 40 hours: pale greenish grey	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Water-blue 3 R (W. ter Meer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark violet (reddish)	Insol.	Great	Great	Insol.	Insol.
Blue BSHL (Oehler)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively ultra- marine- blue (reddish)	Insol.	Insol.	Fair	Insol.	Insol.
Cotton-blue OO (Oehler)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Ultra- marine- blue (bluish)	Insol.	Insol.	Fair	Insol.	Insol.
Alkali-blue 5 B (Oehler)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very fiery ultra- marine- blue	Insol.	Fair	Fair	Insol.	Insol.
Alkali-blue 7 B (Oehler)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery ultra- marine- blue	Insol.	Fair	Fair	Insol.	Insol.
Alkali-blue H 7 B (Oehler)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright ultra- marine	Insol.	Fair	Fair	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Dirty red-violet. Top liq.: colourless, clear	Dark brown-red. Top liq.: very pale pink, clear	<i>Brilliant brown-red.</i> Op. I.: Reddish violet, constant, clear Op. II.: Very dark dirty red-violet precipitate. Top liq.: colourless Op. III.: Colourless	No effect	In 40 hours: much brighter and greener	5 per cent. precipitation.
Pale, colcothar-like coloured. Top liq.: colourless, clear	Very dark brown-red. Top liq.: colourless, clear	<i>Dark brown-red.</i> Op. I.: Indigo-blue, constant, clear Op. II.: Ultramarine-blue flocculent precipitate. Top liq.: Brilliant blue, clear Op. III.: Colourless	No effect	In 70 hours: much faded (dark bluish grey)	5 per cent. precipitation.
Pale purple-red. Top liq.: colourless, clear	Dark purple. Top liq.: colourless, clear	<i>Bright brown-red.</i> Op. I.: Bright blue, constant, clear Op. II.: Bright ultramarine-blue flocculent precipitate. Top liq.: brilliant blue, clear Op. III.: Colourless	No effect	In 70 hours: much faded (dark bluish grey)	5 per cent. precipitation.
Dark brown-red. Top liq.: colourless, clear	Colcothar-like coloured. Top liq.: colourless, clear	<i>Brilliant brownish red.</i> Op. I.: Brilliant blue, later a partial blue finely flocculent precipitate. Top liq.: pale blue. Op. II.: Pure blue flocculent precipitate. Top liq.: colourless Op. III.: Colourless	No effect	In 70 hours: dirty dark reddish blue	5 per cent. precipitation.
Dark red-violet. Top liq.: colourless, clear	Reddish brown. Top liq.: colourless, clear	<i>Brownish red (nearly blood-red).</i> Otherwise as above	No effect	In 70 hours: darker and greener	5 per cent. precipitation.
Bluish colcothar-like. Top liq.: colourless, clear	Chocolate-brown. Top liq.: colourless	<i>Bright brownish red.</i> Otherwise as above	No effect	In 70 hours: much paler and darker	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Navy-blue BN (Bad.)	Barytes	Tannin and antimony salt	Reddish ultra-marine-blue	Insol.	Fair	Great	Insol.	Insol.
	China-clay	None	Lively ultra-marine-blue	Insol.	Fair	Fair	Insol.	Insol.
	Green-earth	None	Dark reddish blue	Insol.	Fair	Fair	Insol.	Insol.
Victoria-blue B (Bad.)	Barytes	Tannin and antimony salt	Dark ultra-marine-blue	Insol.	Traces	Somewhat	Insol.	Insol.
	China-clay	None	Bright ultra-marine-blue (reddish)	Insol.	Fair	Great	Insol.	Insol.
	Green-earth	None	Dark greenish blue	Insol.	Fair	Fair	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Bluish grey. Top liq.: pale yellowish, clear	Completely decomposed. Res.: greenish grey. Top liq.: brownish, clear	<i>Dark yellowish grey.</i> Op. I.: Brilliant indigo-blue; first clear, later a partial greenish blue precipitate. Op. II.: Indigo-blue flocculent precipitate. Top liq.: colourless Op. III.: Colourless	At once, dark bluish green. In 10 days : Res.: dirty greenish grey Top liq.: pale greenish, turbid	In 75 hours : darker and greener	3 per cent. precipitation.
Somewhat duller and redder; no further effect	No effect		Blackish green In 4 days : Res.: pale greenish grey Top liq.: colourless, clear	In 70 hours : redder and brighter grey	3 per cent. precipitation.
No effect	No effect	Dirty yellowish green (from the carrier); otherwise as above	Very dark bluish green. After 3 days : Res.: dirty dark green (carrier). Top liq.: colourless, clear	In 70 hours : darker and greener	2 per cent. precipitation.
Dark red-brown. Top liq.: pale yellowish brown, clear.	Dark brown. Top liq.: reddish brown, clear	<i>Very lively bright brown-red.</i> Op. I.: Lively greenish blue, clear, gradually fades Op. II.: Dark ultramarine-blue flocculent precipitate. Top liq.: colourless, clear Op. III.: Colourless	Dark greenish blue. After 2 weeks : no remarkable change	In 60 hours : completely discoloured ; dark grey	3 per cent. precipitation.
Dark colcothar-like coloured. Top liq.: colourless, clear	Chocolate-brown. Top liq.: colourless, clear		Dark greenish blue. No further effect	In 60 hours : completely discoloured (blue grey)	3 per cent. precipitation.
Blue-black. Top liq.: colourless, clear	Blue-black. Top liq.: colourless, clear	Dark brown-red ; otherwise as above	Dirty greenish grey. No further effect	In 70 hours : greenish grey	2 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Victoria pure blue (Bad.)	Barytes	Tannin and antimony salt	Ultra-marine-blue (dark)	Insol.	Traces	Somewhat	Insol.	Insol.
	China-clay	None	Ultra-marine-blue (reddish)	Insol.	Somewhat	Great	Insol.	Insol.
	Green-earth	None	Indigo-bluish	Insol.	Fair	Fair	Insol.	Insol.
New methylene-blue GG (Cass.)	Barytes	Tannin and antimony salt	Very dark bluish green	Insol.	Insol.	Fair	Insol.	Insol.
	China-clay	None	Reddish blue (dark)	Insol.	Insol.	Fair	Insol.	Insol.
	Green-earth	None	Dark bluish green	Insol.	Insol.	Insol.	Insol.	Insol.

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl.	In Direct Sunlight.	Special Remarks.
Brick-red. Top liq.: pale reddish brown, clear	Lively light brown (reddish). Top liq.: reddish brown, clear	<i>Bright brownish orange.</i> Op. I.: Very pale greenish blue, clear, gradually fading Op. II.: Dark greenish blue flocculent precipitate. Top liq.: colourless, clear Op. III.: Colourless	Dark bluish green. In 2 weeks: brighter and yellower (olive). Top liq.: pale yellowish, clear	In 60 hours: completely colourless (dirty grey)	3 per cent. precipitation.
Dirty red-violet. Top liq.: colourless, clear	Pale reddish violet. Top liq.: colourless, clear		At once, grass green. In 2 weeks: somewhat yellower. Top liq.: colourless, clear	In 60 hours: bright grey	3 per cent. precipitation.
Slightly darker and redder. Top liq.: colourless, clear	Deep black-blue. Top liq.: colourless, clear	Dark reddish brown (due to the carrier); otherwise as above.	Dirty bluish green. In 2 weeks: much brighter and yellower. Top liq.: colourless, clear	In 70 hours: dirty grey green	2 per cent. precipitation.
Black-brown. Top liq.: pale brownish, clear	Deep red-brown. Top liq.: reddish brown, clear	<i>Brilliant brownish red.</i> Op. I.: A partial greenish blue finely flocculent precipitate. Top liq.: very pale greenish blue Op. II.: Voluminous, dark greenish blue precipitate. Top liq.: colourless Op. III.: Faintly reddish	Deep yellowish green. In 2 weeks: somewhat brighter; no further change	In 70 hours: much darker and redder	3 per cent. precipitation.
Blackish violet. Top liq.: colourless, clear	Blackish red-violet. Top liq.: colourless, clear		In 24 hours: completely decolorised. Res.: greenish grey. Top liq.: very pale greenish, turbid	In 70 hours: much brighter and redder	3 per cent. precipitation.
Blackish green. Top liq.: colourless, clear	Blue-black. Top liq.: colourless, clear	Dark brown (due to the carrier); otherwise as above	In 24 hours: completely decolorised. Res.: dirty green. Top liq.: pale yellowish green, turbid	In 70 hours: only slightly duller	2 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Capri-blue GN (Mühl.)	Barytes	Tannin and antimony salt	Bright greenish blue	Insol.	Traces	Traces	Insol.	Insol.
	China-clay	None	Bright greenish blue	Insol.	Traces	Somewhat	Insol.	Insol.
	Green-earth	None	Bright bluish green	Insol.	Insol.	Insol.	Insol.	Insol.
Methylene-blue R (M. L. Br.)	Barytes	Tannin and antimony salt	Dark blue (reddish)	Insol.	Fair	Great	Insol.	Insol.
	China-clay	None	Very reddish blue	Insol.	Traces (red-violet)	Great	Insol.	Insol.
	Green-earth	None	Dark greenish blue	Insol.	Traces (red-violet)	Traces	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Decolorised immediately. Res.: reddish grey. Top liq.: pale brown, clear	Decolorised. Res.: pale pink. Top liq.: brownish red, clear	<i>Blackish green.</i> Op. I.: Through pale pink, dull greenish blue, gradually fading Op. II.: Through red, a scanty dull greenish blue fine precipitate. Top liq.: colourless, clear	In 8 hours : completely decolorised. Res.: bluish white. Top liq.: colourless, turbid	In 70 hours : a trifle darker	3 per cent. precipitation.
Red violet. Top liq.: colourless, clear	Duller and redder. Top liq.: colourless, clear	Op. III.: Colourless	In 5 hours : decolorised. Res.: white. Top liq.: colourless, turbid	In 70 hours : much redder	3 per cent. precipitation.
Blacker. Top liq.: colourless, clear	Darker and greener. Top liq.: colourless, clear	Greenish black (due to the carrier) ; otherwise as above	In 8 hours : decolorised. Res.: greenish grey (carrier). Top liq.: colourless, turbid	In 70 hours : almost no effect	2 per cent. precipitation.
Black-grey. Top liq.: pale brownish red, clear	Reddish black. Top liq.: brownish red, clear	<i>Brilliant yellowish green.</i> Op. I.: Greenish blue, clear ; later, a partial blue precipitate Op. II.: Lively blue finely flocculent precipitate. Top liq.: colourless, clear	In 20 hours : decolorised. Res.: bright greenish grey. Top liq.: colourless, turbid	In 70 hours : darker and greener	3 per cent. precipitation.
Somewhat redder. Top liq.: colourless, clear	Darker and bluer. Top liq.: colourless, clear	Op. III.: Colourless	In 20 hours : decolorised. Res.: greenish white. Top liq.: colourless, turbid	In 70 hours : brighter and redder	3 per cent. precipitation.
Redder and darker. Top liq.: colourless, clear	Redder and darker. Top liq.: colourless, clear	Blackish green (due to the carrier) ; otherwise as above	In 20 hours : decolorised. Res.: greenish blue. Top liq.: colourless, turbid.	In 70 hours : much greener	2 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Methylene-blue BB (M. L. Br.)	Barytes	Tannin and antimony salt	Dark greenish blue	Insol.	Traces	Somewhat	Insol.	Insol.
	China-clay	None	Very reddish blue	Insol.	Traces	Somewhat	Insol.	Insol.
	Green-earth	None	Dark greenish blue	Insol.	Insol.	Traces	Insol.	Insol.
Methylene-blue BG (Bad.)	Barytes	Tannin and antimony salt	Dark greenish blue	Insol.	Fair	Great	Insol.	Insol.
	China-clay	None	Reddish ultra-marine-blue	Insol.	Insol.	Fair	Insol.	Insol.
	Green-earth	None	Dark greenish blue	Insol.	Insol.	Insol.	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Decolorised. Res.: reddish grey Top liq.: pale brownish, clear	Greenish grey. Top liq.: pale reddish brown	<i>Brilliant yellow-green.</i> Op. I.: Lively greenish blue. At first, clear; later, a partial blue finely flocculent precipitate Op. II.: Lively reddish blue finely flocculent precipitate. Top liq.: colourless, clear Op. III.: Colourless	In 14 hours: decolorised. Res.: bluish white. Top liq.: colourless, turbid	In 70 hours: somewhat darker	3 per cent. precipitation.
Lively red-violet Top liq.: colourless, clear	Dark greenish blue. Top liq.: colourless, clear	Op. III.: Colourless	In 18 hours: decolorised. Res.: bluish grey. Top liq.: colourless, turbid	In 70 hours: somewhat brighter and much redder	3 per cent. precipitation.
Dark red-violet. Top liq.: colourless, clear	Dark colcothar-like. Top liq.: colourless, clear	Dark olive-green (from the carrier); otherwise as above	In 20 hours: decolorised. Res.: greenish grey (carrier). Top liq.: colourless, turbid	In 70 hours: somewhat duller	2 per cent. precipitation.
Decomposed. Res.: white. Top liq.: reddish brown, clear	Greenish black; later, bluer. Top liq.: pale brownish red, clear	<i>Bright yellowish green.</i> Op. I.: Very bright blue; later, a partial reddish blue precipitate Op. II.: Greenish blue dark flocculent precipitate. Top liq.: colourless, clear Op. III.: Colourless	In 24 hours: decolorised. Res.: white. Top liq.: colourless, turbid	In 70 hours: somewhat darker	3 per cent. precipitation.
Much redder. Top liq.: faintly pink, clear	Darker and greener. Top liq.: colourless, clear	Op. III.: Colourless	In 29 hours: decolorised. Res.: bluish white. Top liq.: colourless, turbid	In 70 hours: a little duller and redder	3 per cent. precipitation.
Much redder. Top liq.: somewhat pink, clear	Darker and redder. Top liq.: colourless, clear	<i>Dark olive-green.</i> (from the carrier); otherwise as above	In 35 hours: decolorised. Res.: grey-green (carrier). Top liq.: colourless, turbid	In 70 hours: a little duller and redder	2 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Methylene-blue BH (Bad.)	Barytes	Tannin and antimony salt	Dark greenish blue	Insol.	Traces	Fair	Insol.	Insol.
	China-clay	None	Reddish ultra-marine	Insol.	Insol.	Somewhat	Insol.	Insol.
	Green-earth	None	Dark greenish blue	Insol.	Insol.	Insol.	Insol.	Insol.
Methylene-blue B (Bad.)	Barytes	Tannin and antimony salt	Dark greenish blue	Insol.	Traces	Great	Insol.	Insol.
	China-clay	None	Lively bluish violet	Insol.	Insol.	Somewhat	Insol.	Insol.
	Green-earth	None	Dark greenish blue	Insol.	Insol.	Insol.	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Completely decomposed. Res.: white. Top liq.: reddish brown, clear	Completely decomposed. Res.: reddish grey. Top liq.: reddish brown, clear	<i>Brilliant yellowish green.</i> Op. I.: Very bright blue. At first, clear; later, partly precipitated (greenish blue) Op. II.: Dark greenish blue flocculent precipitate. Top liq.: colourless.	In 24 hours: decolorised. Res.: white. Top liq.: colourless, turbid	In 70 hours: duller and darker	3 per cent. precipitation.
Reddish violet. Top liq.: faintly reddish, clear	Much greener. Top liq.: colourless, clear	Op. III.: Colourless	In 30 hours: decolorised. Res.: white (greenish). Top liq.: colourless, turbid	In 70 hours: somewhat brighter and redder	3 per cent. precipitation.
Dark red-violet. Top liq.: faintly red, clear	Darker and redder. Top liq.: colourless, clear	Dark olive-green (from the carrier); otherwise as above	In 35 hours: decolorised. Res.: greenish grey. Top liq.: colourless, turbid	In 70 hours: rather greener	2 per cent. precipitation.
Completely decomposed. Res.: white. Top liq.: brilliant red-brown, clear	Blackish green. Top liq.: reddish brown, clear	<i>Brilliant yellowish green.</i> Op. I.: Bright blue, clear; later, partly precipitated (reddish blue) Op. II.: Dark reddish blue flocculent precipitate. Top liq.: colourless, clear	In 24 hours: decolorised. Res.: white. Top liq.: colourless, turbid	In 70 hours: darker and redder	3 per cent. precipitation.
Somewhat duller and redder. Top liq.: faintly reddish, clear	Darker and greener. Top liq.: colourless, clear	Op. III.: Colourless	In 30 hours: decolorised. Res.: white. Top liq.: colourless, turbid	In 70 hours: duller and redder	3 per cent. precipitation.
Darker and redder. Top liq.: colourless, clear	Darker and redder. Top liq.: colourless, clear	Dark olive-green (from the carrier); otherwise as above	In 30 hours: decolorised. Res.: greenish grey. Top liq.: colourless, turbid	In 70 hours: duller and redder	2 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Turquoise-blue BB (Bayer)	Barytes	Tannin and antimony salt	Dark blue-green	Traces	Fair	Fair	Insol.	Insol.
	China-clay	None	Lively greenish blue	Insol.	Somewhat	Great	Insol.	Insol.
	Green-earth	None	Dark bluish green	Insol.	Traces	Somewhat	Insol.	Insol.
Turquoise-blue G (Bayer)	Barytes	Tannin and antimony salt	Deep bluish green	Traces	Traces	Somewhat	Insol.	Insol.
	China-clay	None	Bright greenish blue	Traces	Great	Great	Insol.	Insol.
	Green-earth	None	Dark bluish green	Insol.	Somewhat	Somewhat	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Completely decomposed. Res.: brick-red. Top liq.: brilliant red-brown, clear	Partly decomposed. Res.: reddish brown. Top liq.: reddish brown, clear	<i>Dark brownish orange.</i> Op. I.: Through yellow, brilliant greenish blue, clear; later, partly precipitated (bluish green) Op. II.: Through yellow and green, greenish blue flocculent precipitate. Top liq.: very pale bluish Op. III.: Colourless	In 6 days: decolorised. Res.: dirty grey-green. Top liq.: pale greenish yellow. turbid	In 60 hours: dark grey	3 per cent. precipitation.
Decolorised. Res.: reddish grey Top liq.: colourless, clear	Dirty bluish green. Top liq.: colourless, clear		In 4 days: decolorised. Res.: light greenish grey. Top liq.: pale yellowish, turbid	In 60 hours: dark grey	3 per cent. precipitation.
Darker and greener. Top liq.: colourless, clear	Lively dark green. Top liq.: colourless, clear	Dark brown-red (from the carrier); otherwise as above	In 6 days: decolorised. Res.: grey-green, dark. Top liq.: colourless, clear	In 60 hours: dirty bluish green	2 per cent. precipitation.
At first, blackish green; later, dark red-violet. Top liq.: reddish brown, clear	At first, blackish green; later, rust-brown. Top liq.: clear yellowish brown, clear	<i>Brilliant golden-yellow.</i> Op. I.: Pale bluish green, clear; later, partly precipitated (blue-green) Op. II.: Dark bluish green finely flocculent precipitate. Top liq.: pale bluish green, clear Op. III.: Colourless	In 10 days: dark green. Top liq.: yellowish green, clear. No further change noticed	In 60 hours: discoloured (yellowish grey)	3 per cent. precipitation.
Dirty red-violet (bright). Top liq.: colourless, clear	Duller and greener. Top liq.: colourless, clear		In 10 days: decolorised. Res.: pale greenish yellow. Top liq.: pale yellowish green, clear	In 60 hours: discoloured (blue-grey)	3 per cent. precipitation.
Darker and greener. Top liq.: colourless, clear	Darker and greener. Top liq.: colourless, clear	Dark brown-yellow (from the carrier); otherwise as above	In 10 days: decolorised. Res.: dirty yellowish green. Top liq.: colourless, clear	In 60 hours: darker and bluer	2 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
New Methylene blue FR (Bayer)	Barytes	Tannin and antimony salt	Dark reddish blue	Traces	Traces	Somewhat	Insol.	Insol.
	China-clay	None	Lively red-violet	Insol.	Traces	Somewhat	Insol.	Insol.
	Green-earth	None	Dark reddish blue	Insol.	Traces	Insol.	Insol.	Insol.
New Methylene blue F (Bayer)	Barytes	Tannin and antimony salt	Dark greenish blue	Traces	Traces	Traces	Insol.	Insol.
	China-clay	None	Lively red-violet	Insol.	Insol.	Fair	Insol.	Insol.
	Green-earth	None	Dark reddish blue	Insol.	Insol.	Insol.	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Carmoisin-red, later reddish violet, dirty. Top liq. : reddish brown, clear	Brown-red. Top liq. : brownish red, clear	<i>Dark moss green.</i> Op. I. : Pale reddish blue, later a partial bright blue precipitate Op. II. : Red-violet fine flocculent precipitate. Top liq. : pale reddish blue Op. III. : Colourless	In 24 hours : decolorised. Res. : white. Top liq. : colourless, turbid	In 70 hours : somewhat paler and darker	3 per cent. precipitation.
Red-violet, later reddish brown. Top liq. : colourless, clear	Dirty reddish grey. Top liq. : colourless, clear		In 30 hours : decolorised. Res. : very bright greenish grey. Top liq. : colourless, turbid	In 70 hours : much paler and redder	3 per cent. precipitation.
Darker and redder. Top liq. : colourless, clear	Blackish red-violet, later somewhat brighter. Top liq. : colourless, clear	Dirty olive-green (from the carrier) ; otherwise as above	In 60 hours, decolorised. Res. : grey-green. Top liq. : colourless, clear	In 70 hours : only a little greener	2 per cent. precipitation.
Carmoisin-red, later partly decomposed. Res. : bright red-violet. Top liq. : dark reddish brown, clear	Brown-red. Top liq. : brownish red, clear	<i>Bright yellowish green.</i> Op. I. : Reddish blue, clear, later strong reddish blue precipitate Op. II. : Dark reddish ultramarine fine flocculent precipitate. Top liq. : colourless, clear Op. III. : Colourless	In 4 days : decolorised. Res. : greenish grey. Top liq. : colourless, turbid	In 70 hours : somewhat darker and greener	3 per cent. precipitation.
Red-violet, later brown-red. Top liq. : colourless, clear	Colcothar-like coloured. Top liq. : colourless, clear		In 4 days : decolorised. Res. : white. Top liq. : colourless	In 70 hours : much darker and redder	3 per cent. precipitation.
Darker and redder. Top liq. : colourless, clear	Blackish red-violet, later brighter. Top liq. : colourless, clear	Dark moss-green (from the carrier) ; otherwise as above	In 5 days : decolorised. Res. : greenish grey. Top liq. : colourless, turbid	In 70 hours : only slightly brighter and greener	2 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
New Methylene blue BB (Bayer)	Barytes	Tannin and antimony salt	Very dark greenish blue	Insol.	Somewhat	Great	Insol.	Insol.
	China-clay	None	Dark reddish blue	Insol.	Insol.	Somewhat	Insol.	Insol.
	Green-earth	None	Pale dark greenish blue	Insol.	Insol.	Insol.	Insol.	Insol.
Fast navy-blue R (Oehler)	Barytes	Tannin and antimony salt	Blackish blue	Insol.	Fair (reddish brown), clear	Great (bluish ruby-red), clear	Insol.	Insol.
	China-clay	None	Dark red-violet	Insol.	Fair (carmine)	Great (red-violet), clear	Insol.	Insol.
	Green-earth	None	Dark reddish blue	Insol.	Traces (yellowish brown), clear	Insol.	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl		
Completely decomposed. Res. : greenish grey. Top liq. : reddish brown, clear	At first, greenish black, later decomposed. Res. : white. Top liq. : red-brown, clear	<i>Bright green (blue tinge).</i> Op. I. : Lively bright blue, clear, later very lively blue partly precipitated Op. II. : Dark reddish blue fine precipitate Op. III. : Colourless	In 4 days : decolorised. Res. : bluish grey Top liq. : colourless, turbid	In 70 hours : somewhat darker and redder	3 per cent. precipitation.
Somewhat darker and redder. Top liq. : slightly red, clear	At first, no effect ; later, somewhat darker and greener. Top liq. : colourless, clear.		In 6 days : decolorised. Res. : bluish grey. Top liq. : colourless, turbid	In 70 hours : somewhat darker and redder	3 per cent. precipitation.
Darker and much redder. Top liq. : colourless, clear	After some time : darker and redder. Top liq. : colourless, clear	Dark olive-green (from the carrier) ; otherwise as above	In 4 days : decolorised. Res. : greenish grey. Top liq. : colourless, turbid	In 70 hours : only slightly duller and greener	2 per cent. precipitation.
Completely decomposed. Res. : white. Top liq. : brilliant red-brown, clear	Black-brown. Top liq. : brownish red, clear	<i>Very dark bluish green (nearly black)</i> Op. I. : Pale dark violet-red, later a partial red-violet precipitate Op. II. : Dark blue-violet flocculent precipitate Op. III. : Colourless	In 36 hours : decolorised. Res. : Yellowish white. Top liq. : colourless, turbid	In 70 hours : only slightly changed	3 per cent. precipitation.
Completely decomposed. Res. : white. Top liq. : olive-green, clear	Dark reddish grey. Top liq. : colourless, clear		In 36 hours : decolorised. Res. : yellowish white. Top liq. : colourless, turbid	In 70 hours : only slightly brighter and redder	3 per cent. precipitation.
Completely decomposed. Res. : greenish grey. Top liq. : yellowish brown, clear	Blue-black. Top liq. : colourless clear.	Black (greenish) ; otherwise as above	In 60 hours : decolorised. Res. : dark reddish grey Top liq. : colourless, turbid	In 70 hours : no effect	1½ per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Acid-green extra conc. (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda calc., Barium chloride	Fiery bluish green	Traces	Insol.	Fair	Insol.	Insol.
Green for lakes BW (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda calc., Barium chloride	Very bright bluish green	Traces	Some-what	Great	Insol.	Insol.
Acid-green extra conc. B (Cass.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda calc., Barium chloride	Lively greenish blue (bright)	Traces	Fair	Great	Insol.	Insol.
Acid-green D conc. (M. L. Br.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda calc., Barium chloride	Fiery bluish green	Traces	Traces	Fair	Insol.	Insol.
Blue-green S (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda calc., Barium chloride	Very bright greenish blue	Traces	Traces	Fair	Insol.	Insol.

LAKES.

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl.	In Direct Sunlight.	Special Remarks.
Much brighter. Top liq.: colourless, clear	Brighter and bluer. Top liq.: colourless, clear	<i>Brownish orange.</i> Op. I.: Bluish green, fades very quickly, turbid Op. II.: Pale bluish green, clear liquid Op. III.: Colourless	After 10 days : only slightly brighter. Top liq.: bluish green, turbid	In 50 hours : much faded (very light greenish blue)	5 per cent. precipitation.
Much brighter. Top liq.: colourless, clear	Brighter and greener. Top liq.: colourless, clear	<i>Pale yellowish green.</i> Op. I.: Very pale bluish green, fades very quickly Op. II.: Scanty bluish grey precipitate. Top liq.: brilliant bluish green, clear Op. III.: Colourless	At first, no change. In 10 days : somewhat brighter. Top liq.: bluish green, turbid	In 50 hours : nearly colourless	5 per cent. precipitation.
Much brighter and greener. Top liq.: colourless, clear	Dirty dark green. Top liq.: colourless, clear	<i>Moss-green.</i> Op. I.: Dull bluish grey, turbid, later partly precipitated Op. II.: Greenish blue flocculent precipitate. Top liq.: lively blue-green, clear Op. III.: Colourless	At first, no change. In 10 days : considerably brighter. Top liq.: bluish green, turbid	In 50 hours : nearly colourless (bluish grey, very bright)	5 per cent. precipitation.
Much brighter. Top liq.: pale yellowish, clear	Darker, paler, and greener. Top liq.: colourless, clear	<i>Brilliant brownish green.</i> Op. I.: Yellowish green, slowly fading, turbid Op. II.: Yellowish green, clear liquid Op. III.: Colourless	At first, no change. In 10 days : much brighter and bluer. Top liq.: bluish green, turbid	In 40 hours : much faded (light greenish grey)	5 per cent. precipitation.
Decolorised. Res.: Bright bluish grey. Top liq.: very pale pink, clear	Greenish grey. Top liq.: colourless, clear	<i>Brilliant brownish yellow.</i> Op. I.: Very bright greenish blue, turbid, later a partial blue-green precipitate Op. II.: Brilliant greenish blue, clear liquid Op. III. Colourless	At first, no change. In 10 days : brighter. Top liq.: bluish green, turbid	In 50 hours : nearly colourless	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Light green SF yellowish (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda calc., Barium chloride	Bright bluish green	Traces	Insol.	Fair	Insol.	Insol.
Light green SL (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda calc., Barium chloride	Deep blue- green	Traces	Insol.	Fair	Insol.	Insol.
Neptune- green SB (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda calc., Barium chloride	Lively sky-blue	Insol.	Traces	Fair	Insol.	Insol.
Neptune- green S (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda calc., Barium chloride	Sky-blue	Insol.	Traces	Fair	Insol.	Insol.
Neptune- green SBN (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Sky-blue	Traces	Fair	Great	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Much brighter and bluer. Top liq.: colourless, clear	Paler and bluer. Top liq.: colourless, clear	<i>Dark brownish orange.</i> Op. I.: Lively bluish green, quickly fading, turbid Op. II.: decolorised, white flocculent precipitate (carrier?) Op. III.: Colourless	In 10 days: no important effect. Top liq.: bluish green, turbid	In 50 hours: much faded (pale light greenish blue)	5 per cent. precipitation.
Much brighter. Top liq.: colourless, clear	Much paler. Top liq.: colourless, clear	<i>Dark brownish orange.</i> Op. I.: Bluish green, quickly fading, turbid Op. II.: Decolorised, scanty white precipitate Op. III.: Colourless	In 10 days: no important effect. Top liq.: bluish green, turbid	In 50 hours: much faded (pale bluish grey)	5 per cent. precipitation.
First, dirty yellow-green; later, brighter and bluer. Top liq.: pale yellowish, clear	Dirty bluish green. Top liq.: colourless, clear	<i>Lively yellowish green.</i> Op. I.: Bright greenish blue, turbid, later a partial bright sky-blue precipitate Op. II.: Bright sky-blue flocculent precipitate Top liq.: deep blue, clear Op. III.: Colourless	In 10 days: no remarkable effect	In 40 hours: very much faded (pale bluish grey)	5 per cent. precipitation.
At first, dirty yellow-green; later, greenish grey. Top liq.: colourless, clear	Dirty bluish green. Top liq.: colourless, clear	<i>Brilliant brownish yellow.</i> Op. I.: Pale sky-blue, turbid, later a partial sky-blue precipitate Op. II.: Clear greenish blue liquid Op. III.: Colourless	In 10 days: no remarkable effect. Top liq.: very pale greenish blue, turbid	In 40 hours: very much faded (pale bluish grey)	5 per cent. precipitation.
Decolorised. Res.: yellowish grey. Top liq.: very pale brownish yellow, clear	Dirty grey-green. Top liq.: colourless, clear	<i>Brilliant brownish yellow.</i> Op. I.: Greenish blue, constant, turbid Op. II.: Rather dull greenish blue finally flocculent precipitate. Top liq.: colourless Op. III.: Colourless	In 10 days: little effect. Top liq.: pale bluish, turbid	In 40 hours: very much faded (nearly colourless)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Neptune-green SG (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Bright greenish blue	Fair	Fair	Fair	Insol.	Insol.
Guinea-green G (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively bluish green	Fair	Fair	Fair	Insol.	Insol.
Guinea-green B (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery bluish green	Fair	Somewhat	Fair	Insol.	Insol.
Guinea-green B extra (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively bluish green	Fair	Traces	Fair	Insol.	Insol.
Guinea-green 12157 (Berl.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very bright yellowish green	Traces	Traces	Fair	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.		
Decolorised. Res.: greenish grey. Top liq.: colourless, clear	Dirty grey-green. Top liq.: colourless, clear	<i>Dirty brownish orange.</i> Op. I.: Bluish green, constant, turbid Op. II.: Very bright greenish blue fine precipitate. Top liq.: brilliant greenish blue, clear Op. III.: Colourless	In 10 days: little change. Top liq.: pale greenish, turbid	In 40 hours: very much faded	5 per cent. precipitation. [A similar lake is obtained from Neptune-green G.—TRANSL.]
Much whiter. Top liq.: pale greenish yellow, clear	Somewhat paler. Top liq.: colourless, clear	<i>Yellowish green, becoming yellower.</i> Op. I.: Pale yellowish green, quickly fading, turbid Op. II.: Through brick-red, dirty bluish green very light precipitate. Top liq.: colourless Op. III.: Colourless	In 10 days: a little changed. Top liq.: very pale yellowish green, turbid	In 40 hours: very much faded (bright greenish blue)	5 per cent. precipitation.
Decolorised. Res.: very pale bluish green. Top liq.: colourless, clear	Dirty grey-green. Top liq.: colourless, clear	<i>Golden-yellow.</i> Op. I.: Lively greenish blue, slowly fading, turbid Op. II.: Through red-bluish, nearly white precipitate. Top liq.: pale bluish green Op. III.: Colourless	In 10 days: somewhat brighter. Top liq.: very pale greenish blue, turbid	In 40 hours: nearly colourless	5 per cent. precipitation.
Decolorised. Res.: very pale blue-green. Top liq.: colourless, clear	Dirty grey-green. Top liq.: colourless, clear	<i>Golden-yellow.</i> Op. I.: Lively blue-green, slowly fading, turbid Op. II.: Through red, very bright bluish grey precipitate. Top liq.: lively blue-green, clear Op. III.: Colourless	In 10 days: little changed. Top liq.: very pale greenish blue, turbid	In 40 hours: nearly colourless	5 per cent. precipitation.
Decolorised. Res.: greenish white. Top liq.: wine-yellow, clear	Much brighter and yellower. Top liq.: colourless, clear	<i>Greenish yellow.</i> Op. I.: Lively yellowish green, turbid, quickly fading Op. II.: Yellowish green, clear liquid Op. III.: Colourless	In 10 days: decolorised. Res.: very pale yellowish. Top liq.: pale yellowish	In 40 hours: colourless	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Turpentine.	Varnish.
Naphthol-green B (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride, Whiting in definite proportions	Pale yellowish green	Insol.	Insol.	Great (emerald- green)	Insol.	Insol.
Acid-green L (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very fiery greenish blue	Fair	Traces	Fair	Insol.	Insol.
Brilliant acid-green 6 B (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Fiery greenish blue	Fair	Fair	Fair	Insol.	Insol.
Fast green, bluish (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Lively bright greenish blue	Fair	Some- what	Fair	Insol.	Insol.
Benzo dark green GG (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Dark olive-green (bluish)	Insol.	Traces (greenish yellow)	Traces	Insol.	Insol.

Reactions of the Lake with				In Direct Sunlight.	Special Remarks.
NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ +HCl.		
Completely decomposed. Res.: white. Top liq.: emerald-green, opaque	Completely decomposed. Res.: white. Top liq.: emerald-green, opaque	<i>Lively brownish orange.</i> Op. I.: Colourless, turbid Op. II.: Lively lemon-yellow liquid, besides white precipitate Op. III.: Colourless	In 6 days : decolorised. Res.: white. Top liq.: colourless, turbid	In 60 hours : only very slightly yellower	5 per cent. precipitation.
Decolorised. Res.: bluish white. Top liq.: colourless, clear	Greenish grey. Top liq.: colourless, clear	<i>Very lively reddish orange.</i> Op. I.: Bluish green, nearly clear, slowly fading Op. II.: Very pale greenish liquid, besides white precipitate Op. III.: Colourless	In 14 days : decolorised. Res.: very pale bluish white. Top liq.: colourless, turbid	In 40 hours : nearly colourless (very bright greenish grey)	5 per cent. precipitation.
Decolorised. Res.: grey-green. Top liq.: colourless, clear	Brownish grey. Top liq.: colourless, clear	<i>Lively brownish orange.</i> Op. I.: Bluish green, constant, nearly clear Op. II.: Scanty dark greenish blue precipitate. Top liq.: pale bluish green, clear Op. III.: Colourless	In 10 days : a little brighter. Top liq.: pale bluish green, turbid	In 40 hours : completely discoloured (pale bluish grey)	5 per cent. precipitation.
Partly decomposed. Res.: dark greenish blue. Top liq.: lively violet, clear	Red-violet. Top liq.: colourless, clear	<i>Dirty greenish yellow.</i> Op. I.: Pale greenish blue, turbid Op. II.: Deep greenish blue liquid. Res.: white (carrier) Op. III.: Colourless	In 10 days : decolorised. Res.: very bright bluish grey. Top liq.: colourless, turbid	In 40 hours : entirely discoloured (greenish grey)	5 per cent. precipitation.
Greenish black	blue-black	<i>Blue-black.</i> Op. I.: Blackish green fine precipitate. Top liq.: colourless, clear Op. II.: Greenish black fine flocculent precipitate. Top liq.: colourless Op. III.: Pale greenish yellow	In 60 hours : completely decolorised. Res.: reddish white Top liq.: colourless, turbid	In 40 hours : entirely discoloured (dark greenish grey)	5 per cent. precipitation.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in				
				Hot Water.	Alcohol.	Acetic Acid.	Tur-pentine.	Varnish.
Benzo-green G (Bayer)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulphate, Soda, Barium chloride	Very pale bluish green	Insol.	Insol.	Insol.	Insol.	Insol.
Brilliant green	Barytes	Tannin and antimony salt	Lively green	Traces	Great	Great	Insol.	Insol.
	China-clay	None	Lively bluish green	Traces	Great	Great	Insol.	Insol.
	Green-earth	None	Lively bluish green	Insol.	Fair	Fair	Insol.	Insol.
Malachite-green	Barytes	Tannin and antimony salt	Lively dark green	Traces	Great	Great	Insol.	Insol.
	China-clay	None	Brilliant greenish blue	Traces	Great	Great	Insol.	Insol.
	Green earth	None	Dark bluish green	Insol.	Fair	Fair	Insol.	Insol.

Reactions of the Lake with

NaOH 12° B.	NaOH 40° B.	H ₂ SO ₄ 66° B.	SnCl ₂ + HCl.	In Direct Sunlight.	Special Remarks.
Small effect. Top liq.: very pale bluish red, clear	Blackish green. Top liq.: pale red-violet, clear	<i>Reddish black.</i> Op. I.: Cheesy, greenish black precipitate. Top liq.: colourless, clear Op. II.: Greenish black flocculent precipitate. Top liq.: colourless, clear Op. III.: Colourless	In 20 hours : completely decolorised. Res.: white. Top liq.: colourless, turbid	In 40 hours : much brighter and yellower	5 per cent. precipitation.
Decolorised. Top liq.: pale reddish brown, clear	Completely decolorised. Res.: white. Top liq.: brownish red, clear	<i>Lively lemon-yellow.</i> Op. I.: Brilliant yellowish green, clear, completely fading Op. II.: Through reddish orange, pale bluish green flocculent precipitate. Top liq.: colourless, clear Op. III.: Colourless	In 4 days : decolorised. Res.: greenish grey. Top liq.: colourless, turbid	In 40 hours : entirely dark grey	3 per cent. precipitation.
Decolorised. Res.: bluish green. Top liq.: colourless, clear	No effect		In 4 days : decolorised. Res.: white. Top liq.: colourless, turbid	In 40 hours : bluish grey	3 per cent. precipitation.
No effect	No effect	Dark brownish yellow (from the carrier); otherwise as above	In 6 days : decolorised. Res.: greenish grey. Top liq.: colourless, grey	In 40 hours : only slightly brighter and paler	2 per cent. precipitation.
Decolorised. Top liq.: pale reddish brown, clear	Completely decolorised. Res.: white. Top liq.: brownish red, clear	<i>Brilliant golden-yellow.</i> Op. I.: Brilliant bluish green, turbid, slowly fading, whereupon an emerald-green fine precipitate is formed Op. II.: Through red and orange, very dark bluish green finely flocculent precipitate. Top liq.: dark red-brown, clear Op. III.: Colourless	No effect	In 40 hours : dark grey (almost black)	3 per cent. precipitation.
Decolorised. Res.: pale bluish green. Top liq.: colourless, clear	No effect		No effect	In 40 hours : dark grey (bluish)	3 per cent. precipitation.
No effect	No effect	Dark brownish yellow (from the carrier); otherwise as above	Blue-black, without being further changed.	In 40 hours : only slightly bluer	2 per cent. precipitation.

G. APPENDIX TABLE.

Colouring Matter.	Carrier.	Precipitating Agent.	Shade.	Solubility of the Lake in	
				Alcohol.	HCl.
Fast yellow	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulph., Soda, Barium chloride	Bright lemon	Sparing	Becomes red
Picric acid	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulph., Soda, Barium chloride	Bright yellow	Soluble, yellow	On boiling, greenish yellow
Alizarine-red	{ Sodium phosphate, Turkey-red oil, Soda	{ Alumin. sulph., Calcium acetate	Bright scarlet	No effect	Yellow. Top liq.: wine- yellow
Lithol-red GG (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulph., Soda, Barium chloride	Scarlet	Slight effect	...
Lithol-red R (Bad.)	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulph., Soda, Barium chloride	Bluish scarlet	Slight effect	...
Purpurin	Like Alizarine	Like Alizarine			
Acid-magenta	Like acid colouring matters		Bluish crimson- red	Slight	No effect
Alizarine-blue	Like Alizarine-red	Like Alizarine-red	Ultramarine- blue	Reddish violet solution	Violet. Top liq.: yellow-red
Rosaniline-blue	Like magenta colouring matters		Dark (greenish) blue	...	Blue solution
Coerulein	Like Alizarine-red	Like Alizarine-red	Bluish green	...	Becomes darker. Top liq.: red
Neptune-green G	{ Barytes, artif. Barytes, Alumina	{ Alumin. sulph., Soda, Barium chloride	Sky-blue (greenish)	Traces	Fair

[TRANSLATOR.]

Reactions of the Lake with		SnCl ₂ + HCl.	Special Remarks.
NaOH.	H ₂ SO ₄ .		
Brownish. Top. liq.: yellow	Brownish red ; solution red	First, pale red ; later, decolorised	
Orange. Sol.: yellow	Decolorised	Decolorised	
Violet	Decomposed ; with NaOH, red-violet	Orange. Top liq.: pale yellow	Very fast to light and water ; fast to spirit.
...	Reddish carmine solution		
...	Brilliant bluish carmine		
Brown	No effect	Decolorised	
Bluish green solution	Violet. Top liq.: pale red	Violet ; on boiling, bluish red	Very fast to light and water ; fast to spirit.
Reddish brown	Red-brown	Blue solution	
...	Becomes darker. Top liq.: dull wine- yellow	...	Very fast to water ; fast to light and spirit.
Dirty bluish green	Brownish yellow		

PART II.

ON TESTING FOR COAL-TAR COLOURS.

IF the tables in Part I. are carefully studied it will be readily noticed that, notwithstanding the numerous substances dealt with, the differential characters allow of the construction of a systematic scheme for the determination of the colour principle in every coal-tar colour lake. Certainly, as already mentioned, the investigation does not proceed so far as to permit of such precise results as are effected in qualitative inorganic analysis; still, the analytical processes have been so far simplified that, in a doubtful case, the lake can be assigned to a particular coal-tar colour group. This is especially the case with those lakes the manufacture of which from differently coloured coal-tar colours is more or less excluded, as, for instance, the yellow, orange, and blue lakes. On the other hand, the special distinct shade of certain aniline lakes at once suggests the idea of their being combinations from various colouring matters. This group comprises, for example, the most fiery and most brilliant green lakes, the brilliancy of which, as is known, can only be brought about by the combined precipitation of yellow and green coal-tar colours; since, as yet, no single yellowish green coal-tar colour has been obtained, and as the preparation of a pure yellowish green lake requires a mixture of yellow and blue colours, the only alternative left would be technically so difficult as to be prohibitive.

The analysis of coal-tar colour lakes is made easier by the fact that the makers always endeavour to obtain the most lively and fiery shades, which can only be effected by using colouring matters known to have the purest shade. With the exception of the green coal-tar colours, such purity of shade is only practicable by a mixture of colouring matters belonging to the same group or to a closely allied group, *e.g.* yellow with yellows, red with reds and oranges, blue with blues. Mixtures of yellow and red, of red or yellow and blue, blue and violet or green colouring matters are rarely used, as they yield more or less dull and defective shades. The following small table will clearly explain the matter:—

Coal-tar Colour Lakes :	Pure Yellow.	Pure Orange.	Pure Red.	Pure Violet.	Pure Blue.	Pure Green.
Can only be made from :	Yellow, yellow and orange colouring matters.	Orange and red colouring matters.	Red and orange (<i>i.e.</i> yellowish red and bluish red) colouring matters.	Violet, red and violet colouring matter.	Pure colouring matters.	Yellow and green colouring matters.
Excluded are :	Mixtures from yellow and red colouring matters.		Mixtures from red and blue colouring matters.			Mixtures from yellow and blue colouring matters.

The market price of the lake and its application often give a fairly reliable clue to the nature of the coal-tar colour used. On lakes used for colouring artificial stone and spirit varnishes or for painting signals and toys, the analyst will, of course, only test for colouring principles known to be suitable for the particular purpose. This at once excludes a large number of coal-tar colours having a similar shade. The commercial value of a lake to be analysed is more or less helpful if the cost price is known. As a matter of fact, owing to the keen competition, the commercial price of the coal-tar colour lakes is so lowered as to yield a very small profit. Hence one can easily guess the cost of the colour likely to be used, as it is generally a low-priced one; and as the number of cheap coal-tar colours is limited, the analysis is consequently rendered easier. This suffices to show that, by the doctrine of chance, the test for colouring matters is much facilitated.

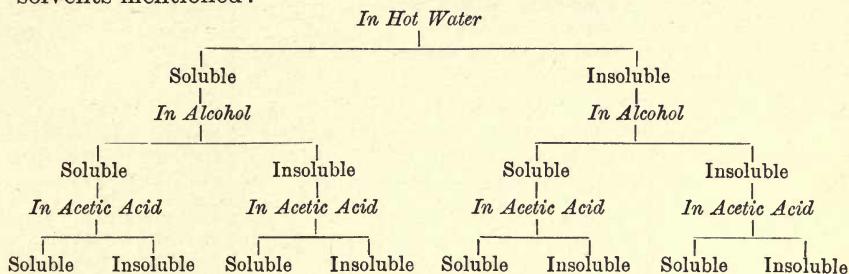
A thorough knowledge of all coal-tar colouring matters, of their methods of preparation, of their behaviour towards a selection of chemicals, and last, but not least, a keen colour sense, are the chief essentials for obtaining good results. Much patience and steady perseverance are also required. If the first trials are generally failures and the work is difficult and prolonged, this would indicate a complex combination, which should increase the interest of the analyst. "Diligence deserves reward" has been the motto of one of the leading German works for more than a century, and is of enhanced value at the present time. And the labour involved is not without its reward, for the earnest worker must find satisfaction in discovering the latest combinations of colouring matters.

As no reliable results are obtainable in qualitative inorganic analysis except by means of definite methodical processes, so random tests are equally excluded in testing for colouring matters in lake pigments with a view to accurately determining the presence of a particular colouring principle. It is rather surprising that no reliable scheme of analysis has been made, considering the characteristic differences which exist between the individual types

and between the groups of colouring matters, as shown in the comprehensive tables forming Part I. of this work.

The sharp distinction of the great mass of material into groups according to their solubility in hot water, alcohol, or acetic acid renders analysis easy and simple. When the degree of solubility of all the coal-tar colour principles has been ascertained it is very easy to assign any particular sample to its appropriate group; one can then readily determine which member of the group it most resembles as regards its solubility in hot water, alcohol, or other solvent under similar conditions.

The following scheme indicates the possible results for the three solvents mentioned:—



On arranging the coal-tar colour precipitates according to their solubility or insolubility we get the following eight classes:—

Class	<i>In Hot Water</i>	<i>In Alcohol</i>	<i>In Acetic Acid</i>
I.	Soluble	Soluble	Soluble
II.	"	"	Insoluble
III.	"	Insoluble	Soluble
IV.	"	"	Insoluble
V.	Insoluble	Soluble	Soluble
VI.	"	"	Insoluble
VII.	"	Insoluble	Soluble
VIII.	"	"	Insoluble

For convenience of reference, the substances mentioned in Part I. are grouped in Part II. according to their solubility or insolubility in each of the solvents separately. Class VIII. is comprised in Tables 1, 2, and 3. Table 1 excludes substances easily soluble in alcohol and acetic acid, while Tables 2 and 3 disregard the precipitates which are easily soluble in hot water.

Misunderstandings will be avoided by noticing that the following tables deal with the solubility of the precipitates from coal-tar colours, which is quite different from that of the colouring matters themselves, as will be seen by examining the detailed description of the precipitate from one and the same colouring matter with China-clay and green-earth.

Heating was avoided in determining the solubility in alcohol and acetic acid, but in the tests for fastness against water the use of distilled water at 60° to 70° C. was always adopted. The reactions given refer solely to this, and are not applicable for their technical employment, for which purpose the solubility in cold water is, of course, the most appropriate guide.

TABLE I.

REACTIONS OF THE COAL-TAR COLOUR LAKES
WITH HOT WATER.

Class.	Insoluble in Hot Water.	Sparingly Soluble in Hot Water.
Yellow lakes containing :	Pigment-chlorine GG in paste } Pigment-chrome-yellow L in } (M. L. Br.) paste Milling-blue O (Cass.) Mikado-yellow G (Mühl.) Auramine O on China-clay or green- earth	Chloramine-yellow GG (Bay.).
Orange lakes containing :	Mikado-orange 3 RO, 4 R (Mühl.) Pigment-orange R in pulp (M. L. Br.) Autol-orange in pulp (Bad.) Permanent orange R in pulp (Berl.)	Orange for lakes ON (Bad.). Mandarin G extra (Berl.). Chloramine-orange G } (Bay.). Pluto-orange G
Red lakes containing :	Ponceau for lakes G extra, B extra (Mühl.) Ponceau 3 RL; pigment- red in pulp G, B } Red for lakes P; Brilliant red for lakes R in pulp } Pigment-Bordeaux R, N } (M. L. Br.) in pulp Pigment-purple A in pulp Rubin B on green-earth New magenta O on China- clay or green-earth Astacin-red B; lithol-red R in pulp } Autol-red in pulp (all brands) } (Bad.) Magenta in powder on China- clay or green-earth Rubin N on China-clay or green-earth } (Berl.) Permanent red 6 B Bordeaux for lakes B Tannin-heliotrope (Cass.) with tannin, clay, or green-earth Helio-purpurin 3 BL; Helio fast red G in pulp } Benzo fast scarlet 5 BS } (Bay.) Rhodulin-red C with tannin, on clay, or green-earth Brilliant rhodulin B with tannin, clay, or green-earth Safranine M ₁₀₀₀ with tannin, clay, or green-earth } Russia-leather-red N on clay } (Oehl.) or green-earth Safranine (all brands) on China-clay or green-earth Eosine (all brands) precipitated by lead nitrate or lead acetate	Vermilion-scarlet (Leipzig). Ponceau for lakes 3 RN Brilliant red G, R } (Bad.). Brilliant carmine L Red for lakes A 101 in } (Berl.) pulp Ponceau 4 R Cloth-red O } (M. L. Br.) Pigment-scarlet 3 B Ponceau 3 R (W. t. M.) } Fast red BT Brilliant Helio-purpurin } (Bay.). 5 BL, 10 BL Benzo fast scarlet 4 BS Benzo-purpurin 4 B } Erythrosine } precipitated by lead Phloxine } nitrate or acetate. Rhodamine (all brands) precipi- tated by resin soap. Magenta in powder, dark (Bad.), precipitated by tannin.

Class.	Insoluble in Hot Water.	Sparingly Soluble in Hot Water.
Violet lakes containing :	Cresyl-violet 2 B (Mühl.) Methylene-violet R (M. L. Br.) Methylene-violet RRA (M. L. Br.) Methylene-violet BN powder (M. L. Br.) Methyl-violet B extra (Bad.) Rhodulin-violet (Bay.) Methyl-violet 2 R, BB (M. L. Br.) Rhodulin-heliotrope (Bay.) Formyl-violet S 4 B (Cass.) Fast acid-violet A 2 R, RO, B (M. L. Br.) Acid-violet 4 R (Bad.) Guinea-violet 4 B; violet for lakes R (Berl.) Benzo fast violet R (Bay.)	Methyl-violet BB (M. L. Br.) Rhodulin-heliotrope (Bay.) Acid-violet 3 RA (M. L. Br.) } precipitated by tannin.
Blue lakes containing :	Cotton-blue OO, soluble in water Dianil-blue G, R; pure blue O Water-blue R Opal-blue (green, red, or bluish shade) Blue for lakes I (Bad.); wool-blue BB, 5 B, R (Berl.) Helio fast blue BL, SL Benzo pure blue Helio-azurin BL, RL Benzo-azurin G Brilliant helio-azurin 5 G, B Benzo fast blue EN, 5 R Benzo-chrome-black-blue Water-blue 3 R (W. t. M.) Cotton-blue OO; blue BSHL (Oehl.) Navy-blue BN; Victoria-blue B (Bad.) Victoria pure blue (Bad.) New methylene-blue GG (Cass.) Capri-blue GN; fast navy-blue R (Oehl.) Methylene-blue BG, BH, B (Bad.) Turquoise-blue BB (Bay.) New methylene-blue FR (Bay.) Turquoise-blue G (Bay.), earth Alkali-blue (all brands)	Blue for lakes CB (Cass.) Patent blue A (M. L. Br.) Neptune-blue B (Bad.) New patent blue GA (Bay.) Turquoise-blue BB (Bay.), precipitated by tannin. Turquoise-blue G (Bay.), on China-clay. New methylene-blue F, FR (Bay.), precipitated by tannin.

TABLE II.

REACTIONS OF THE COAL-TAR COLOUR LAKES WITH ALCOHOL.

Class.	Insoluble in Alcohol.	Springly Soluble in Alcohol.
Yellow lakes containing :	Mikado-golden-yellow G, 2 G, 4 G } Mikado-golden-yellow 6 G, 8 G } (Mühl.)	Chinolin-yellow. Milling-yellow OO (Cass.). Pigment-chlorine in pulp (M. L. Br.). Chloramine-yellow GG ; paper-yellow R (Bay.). Direct yellow R extra. Mordant-yellow G, R ; Astacin yellow R (Bad.). Cloth-yellow G (Oehl.).
Orange lakes containing :	Mikado-orange 3 RO, 4 R (Mühl.)	Pluto-orange G ; Congo-orange G (Bay.).
Red lakes containing :	Vermilion-scarlet G, R (Leipzig) Ponceau for lakes G extra, B extra, L (Mühl.) Ponceau 3 RL ; Chromotrop 8 B (M. L. Br.) Ponceau for lakes 3 RN ; Lithol-red in pulp } Brilliant carmine L ; Astacin-red B } (Bad.) Ponceau RR for lakes Ponceau RRL, 3 RL } Scarlet-red A 101 ; Bordeaux for lakes B } (Berl.) Benzo fast scarlet 5 BS (Bay.)	Ponceau 2 RX (Leipzig). Palatine ponceau for lakes G, GG } Ponceau for lakes LN, LE, 2 RZ } (Bad.) Ponceau for lakes G, R ; Fast red BN } Erythrin X ; Ponceau BN } Ponceau GRI, RL, 2 RL, 5 R } Pigment-scarlet 3 B ; Bordeaux G, R } Brilliant crocein B, BB, 5 B, bluish, yellowish } (M. L. Br.) Phloxine BA extra O, GA extra O } Ponceau GL, RL, RL 57299, 4 R, 4 BGL, 44099 (Berl.). Guinea-red 4 R ; Colombia fast scarlet 4 B. Ponceau 3 R (W. t. M.). Brilliant crocein 9 B ; Amaranth B } Erythrosine yellowish, B } (Cass.) Brilliant helio-purpurin B } Benzo-purpurin 4 B } Fast red BT } (Bay.) Benzo fast scarlet 4 BS } Azo-phloxine 2 G } Helio fast red G } Brilliant acid-carmine G, B, 6 B (Oehl.). Rose Bengale (all brands). Rubine } Magenta } with China-clay or Safranine } green-earth.

Class.	Insoluble in Alcohol.	Springly Soluble in Alcohol.
Violet lakes containing :	Cresyl-violet 2 B (Mühl.), on China-clay or green-earth Violet for lakes R (Berl.) Helio-violet RL (Bay.)	Methylene-violet (precipitated by tannin). Fast acid-violet B (M. L. Br.). Acid-violet 4 R (Bad.). Guinea-violet 4 B (Berl.).
Blue lakes containing :	Cotton-blue O, soluble in water } (M. L. Br.) Dianil-blue ; pure blue O } Benzo fast blue BN, 5 R } Helio-azurin RL, BL } Brilliant azurin 5 G ; P } (Bay.) Benzo-azurin G } Brilliant benzo-blue 6 B } Benzo pure blue } Benzo-chrome-black-blue B } Blue BSHL ; cotton-blue OO (Oehl.) } New Methylene-blue GG (Cass.), precipitated by tannin } Capri-blue GN (Mühl.) on green-earth } Methylene-blue BG, BH, B (Bad.), on China-clay or green-earth } New methylene-blue BB, F (Bay.), on China-clay or green-earth }	Blue for lakes CB (Cass.). Neptune-blue B (Bad.). Helio fast blue BL, SL } (Bay.) Wool-blue N ; New patent blue GA } Victoria-blue B } precipitated by tannin. Victoria pure blue } (Bad.) Capri-blue GN (Mühl.), precipitated by tannin or with China-clay. } Methylene-blue R } on China-clay or green-earth. Methylene-blue BB } (Bad.) Methylene-blue BH, B (Bad.) } Turquoise-blue G } precipitated by tannin. Methylene-blue FR } (Bay.) New methylene-blue F, BB } (Bay.) Fast navy-blue (Oehl.), on green-earth.
Green lakes containing :	Acid-green extra conc. (Cass.) Acid-green D conc. (M. L. Br.) Light green SF, SL (Bad.) Naphthol-green Benzo-green G (Bay.)	Green for lakes BW (Cass.). Blue-green S (Bad.). Neptune-green S, SB (Bad.). Guinea-green B, B extra, 12157 (Berl.). Acid-green L ; Benzo dark green GG (Bay.).
Brown lakes containing :		Phosphine 2 G, 3 R (Berl.), on China-clay. Benzo chrome-brown G, R (Bay.). Chloramine-brown G (Bay.).

TABLE III.

REACTIONS OF THE COAL-TAR COLOUR LAKES
WITH ACETIC ACID.

Class.	Insoluble in Acetic Acid.	Sparingly Soluble in Acetic Acid.
Yellow lakes containing :	Mikado-yellow G (Mühl.) Pigment chrome-yellow L (M. L. Br.)	Pigment-chlorine GG (M. L. Br.) Mikado golden-yellow GG (Mühl.) Chrysophenin G (Bay.) Paper-yellow 3 G (Bad.) Pyramin-yellow for lakes (Bad.)
Orange lakes containing :	Autol-orange in pulp (Bad.)	Mikado-orange 3 RO (Mühl.) Fast orange O (M. L. Br.) Chloramine-orange G (Bay.) Pluto-orange G (Bay.) Pigment-orange R in pulp (M. L. Br.) Permanent orange R (Berl.)
Red lakes containing :	Astacin-red B (Bad.) Lithol-red R in pulp (Bad.) Autol-red GL, RLP, RLP bluish in pulp (Bad.) Pigment-red G in pulp (M. L. Br.) Pigment-Bordeaux R, N in pulp (M. L. Br.) Benzo fast scarlet 5 BS (Bay.) Benzo-purpurin 4 B (Bay.) Most brands of phloxine and rose Bengale	Ponceau for lakes G extra (Mühl.) Ponceau RL, 2 RL, 3R L (M. L. Br.) Pigment-scarlet 3 B (M. L. Br.) Pigment-red B in pulp (M. L. Br.) Brilliant red for lakes in pulp (M. L. Br.) Brilliant carmine L (Bad.) Ponceau RR for lakes (Bad.) Autol-red BGL, BL in pulp (Bad.) Ponceau GL (Berl.) Scarlet for lakes A 101 in pulp (Berl.) Bordeaux for lakes B (Berl.) Brilliant helio-purpurin B (Bay.) Safranine, on China-clay or green-earth.
Violet lakes containing :	Cresyl fast violet 2 B (Mühl.) on green-earth Violet for lakes R (Berl.)	Rhodulin-heliotrope (Bay.) } on Rhodulin-violet (Bay.) } green-earth.
Blue lakes containing :	Benzo fast blue 5 R (Bay.) Helio-azurin RL, BL (Bay.) Brilliant helio-azurin B, 5 G (Bay.) Benzo-azurin G (Bay.) Benzo-chrome-black-blue B (Bay.) New methylene-blue GG (Cass.), on green-earth Benzo pure blue (Bay.) Capri-blue GN (Mühl.), on green-earth New methylene-blue (Bay.), on green-earth Fast navy-blue R (Oehl.), on green-earth	Dianil-blue (all brands) (M.L.Br.) Helio fast blue BL, SL (Bay.) Benzo fast blue BN (Bay.) Capri-blue GN (Mühl.), precipitated by tannin. Methylene-blue (all brands), on green-earth.
Green lakes containing :	Benzo-green G (Bay.)	Benzo dark green GG (Bay.)
Brown lakes containing :	Phosphine 2 G, 3 R (Berl.)	Benzo-chrome-brown G, R (Bay.) Chloramine-brown G (Bay.)

TABLE IV.

CLASS I.—PRECIPITATED COAL-TAR COLOURS SOLUBLE IN HOT WATER, ALCOHOL, AND ACETIC ACID.

Yellow lakes containing :	<p>Auramine, precipitated by tannin or with China-clay. Chloramine-yellow M ; Fast light yellow G ; Paper-yellow G ; Sulfon-yellow R ; Indian-yellow (Bay.). Paper-yellow A, 3 G, RR ; Pyramin-yellow G for lakes } (Bad.). Astacin-yellow R Azo-yellow O ; Victoria-yellow conc. (M. L. Br.). Citronin G₀₀₀, R₀₀ ; Cloth-yellow G, R (Oehl.). Curcumein extra fine (Beyer & Kegel). All brands of naphthol-yellow and metanil-yellow (from all makers). Thioflavin T (Cass.).</p>
Orange lakes containing :	<p>Orange II., II. extra conc. (W. t. M.). Orange RL (Beyer & Kegel). Orange extra, ENL, II. (Cass.). Orange II. L, II. R } (M. L. Br.). Brilliant orange G, R } Orange extra, II. (Bad.). Mandarin RL (Berl.). Orange II. B (Bayer & Co.).</p>
Red lakes containing :	<p>Xylidine ponceau R ; Fast-red conc. 130 ; Bordeaux double conc. (Beyer & Kegel). Excelsior ponceau for lakes JJN ; Brilliant ponceau G ; Ponceau } (Cass.). for lakes GG, R } Brilliant crocein B, M, B₀₀, M₀₀, 9 B Ponceau GRLH, GRL, B extra Scarlet GRL ; Bordeaux O ; Chromotrop 10 R ; Crystal- } (M. L. Br.). ponceau 6 R } Ponceau for lakes LGN ; Fast red AV ; Fast ponceau B (Bad.). Azo-carmin B (Bad.). Ponceau GL, 3 RB, BO extra, 6 RB, 58940, 64580 (Berl.). Ponceau GR, 2 R (W. t. M.). Brilliant double scarlet 3 R ; Crocein-scarlet 10 B ; Benzo- } (Bayer & Co.). Bordeaux 6 B } Leather-red R ; Brilliant crocein 3 B, 3 B conc., 20712. Most brands of Safranine, Magenta, and Rubin (from all makers), precipitated by tannin (see also the other classes).</p>
Brown lakes containing :	Fast brown GR, precipitated by barium-chloride (Berl.).
Violet lakes containing :	<p>Methyl-violet 2 R (M. L. Br.), precipitated by tannin. Acid-violet N (M. L. Br.), precipitated by barium-chloride.</p>
Blue lakes containing :	Patent-blue L (M. L. Br.).
Green lakes containing :	<p>Neptune-green SG (Bad.). Guinea-green G, B (Berl.). Brilliant acid-green 6 B (Bayer & Co.).</p>

TABLE V.

CLASS II.—PRECIPITATED COAL-TAR COLOURS, SOLUBLE IN HOT WATER AND ALCOHOL, INSOLUBLE IN ACETIC ACID.

	Colouring Matter.	Hot Water.	Alcohol.	Acetic Acid.
	Chrysophenin G (Bay.)	Very sol.	Very sol.	Traces.
	Fast-orange O (M. L. Br.)	Fairly sol.	Fairly sol.	"
	Curcumein GG (Beyer & Kegel)	"	"	"

TABLE VI.

CLASS III.—PRECIPITATED COAL-TAR COLOURS, SOLUBLE IN HOT WATER AND ACETIC ACID, INSOLUBLE IN ALCOHOL.

	Colouring Matter.	Hot Water.	Alcohol.	Acetic Acid.
Yellow lakes containing:	Mordant-yellow G, R (Bad.) Paper-yellow R (Bay.)	Fairly sol. "	Traces "	Fairly sol. "
Orange lakes containing:	Congo-orange G (Bay.)	"	"	"
Red lakes containing:	Ponceau RX; Vermilion-scarlet R (Beyer & Kegel)	"	Insol.	"
	Excelsior ponceau JN	"	Traces	"
	Palatine ponceau for lakes GG, G	"	"	"
	Ponceau for lakes LN, LE, 2 RZ	"	"	"
	Erythrine X; Ponceau G for lakes	"	"	"
	Ponceau R for lakes; Ponceau BN	"	"	"
	Fast-red BN	"	"	"
	Ponceau for lakes L (Mühl.)	"	Insol.	"
	Ponceau GRI, RL (M. L. Br.)	"	Traces	"
	Ponceau RL, RL 57299, 44099 (Berl.)	"	"	Very sol.
	Ponceau 4 GBL (Berl.)	"	"	Fairly sol.
	Ponceau RRL (Berl.)	"	Insol.	Very sol.
	Amaranth B (Cass.)	Very sol.	Traces	Fairly sol.
	Brilliant croceine B, BB, 5 B, R, bluish, yellowish (M. L. Br.)	Fairly sol.	"	"
	Bordeaux G, R (M. L. Br.)	"	"	"
	Brilliant acid carmine G, B, 6 B (Oehl.)	"	"	"
	Chromotrope 6 B, 8 B (M. L. Br.)	"	Insol.	Very sol.
	Ponceau RL (Berl.)	"	"	Fairly sol.
Violet lake containing:	Helio-violet RL (Bay.)	"	"	"
Blue lake containing:	Wool-blue N (Bay.)	"	Traces	"
Green lake containing:	Guinea-green B extra (Berl.)	"	"	"
	Acid-green L; fast green bluish (Bay.)	"	"	"

TABLE VII.

CLASS IV.—PRECIPITATED COAL-TAR COLOURS, SOLUBLE IN HOT WATER, INSOLUBLE IN ALCOHOL AND ACETIC ACID.

	Colouring Matter.	Hot Water.	Alcohol.	Acetic Acid.
	Citronin A, G (Mühl.)	Fairly sol.	Traces	Traces.
	Ponceau 2 RL (M. L. Br.)	"	"	"
	Ponceau RR for lakes	"	Insol.	"
	Ponceau GL; Guinea-red 4 R (Berl.)	"	Traces	"
	Columbia fast scarlet 4 B (Berl.)	"	"	"

TABLE VIII.

CLASS V.—PRECIPITATED COAL-TAR COLOURS, INSOLUBLE IN HOT WATER, SOLUBLE IN ALCOHOL AND ACETIC ACID.

	Colouring Matter.	Hot Water.	Alcohol.	Acetic Acid.
Orange lakes containing :	Orange for lakes ON Mandarin GG (Berl.)	Traces "	Fairly sol. "	Fairly sol. "
Brown lakes containing :	Vesuvine 4 GB (M. L. Br.) } on Bismarck-brown F (Bay.) } China-clay	Insol. "	Readily sol. Fairly sol.	" "
Red lakes containing :	Brilliant-red G, R for lakes (Bad.)	Traces	"	"
	Helio-purpurin 3 BL, 5 BL, 10 BL (Bay.)	Insol.	"	"
	Cloth-red O (M. L. Br.)	Traces	"	Very sol.
	Eosine A, W, yellowish for lakes (Bad.)	Insol.	"	"
	Eosine A 5 G, A 2 GL, BB extra (M. L. Br.)	"	"	"
	Rhodamine, precipitated by resin soap	Traces	Very sol.	"
	Permanent red 6 B in pulp (Berl.)	Insol.	Fairly sol.	"
	Red for lakes P in pulp (Berl.)	"	"	"
	Safranine ^{ooo} (Oehl.), precipitated by tannin	"	"	"
	New magenta O (M. L. Br.), on China- clay	"	Very sol.	Fairly sol.
	Rubin B (M. L. Br.), on green-earth	"	Fairly sol.	"
	Rubin N (Berl.), on China-clay	"	"	"
	Magenta in powder AB, dark (Bad.), on China-clay	"	"	"
	Tannin-heliotrope B (Cass.), precipitated by tannin or on China-clay	"	"	Very sol.
	Rhodulin-red B (Bay.), precipitated by tannin or on China-clay	"	"	"
	Brilliant rhodulin (Bay.), precipitated by tannin or on China-clay	"	"	"
	Russia-leather-red N (Oehl.), on China-clay or green-earth	"	"	"

	Colouring Matter.	Hot Water.	Alcohol.	Acetic Acid.	
Violet lakes containing :	Cresyl-violet 2 B (Mühl.), precipitated by tannin	Insol.	Fairly sol.	Very sol.	
	Methyl-violet R (M. L. Br.)	} precipitated by tannin or on China-clay or green-earth	"	"	
	Methyl-violet BB (M. L. Br.)		"	"	
	Methyl-violet 2 R (M. L. Br.), on China-clay or green-earth	"	"	"	
	Methylene-violet RRA (M. L. Br.), on China-clay or green-earth	"	"	"	
	Methylene-violet BN (M. L. Br.), precipitated by tannin	"	"	"	
	Methyl-violet B extra (Bad.), precipitated by tannin or on China-clay or green-earth	"	"	"	
	Rhodulin-heliotrope (Bay.), precipitated by tannin or on China-clay	"	"	"	
	Formyl-violet S 4 B (Cass.)	"	"	Fairly sol.	
	Fast acid-violet A 2 R, RO (M. L. Br.)	"	"	"	
	Acid-violet 3 RA (M. L. Br.)	Traces	"	"	
	Benzo fast violet	Insol.	"	"	
	Blue lakes containing :	Opal-blue (all brands) (M. L. Br.)	"	"	"
Alkali-blue (all brands)		"	Very sol.	Very sol.	
Water-blue R (M. L. Br.)		"	Fairly sol.	"	
Patent blue A (M. L. Br.)		Traces	"	Fairly sol.	
Navy-blue BN (Bad.), precipitated by tannin or on China-clay or green-earth		Insol.	"	Very sol.	
Blue for lakes I (Bad.)		"	"	"	
Wool-blue B, BB, R (Berl.)		"	"	"	
Water-blue 3 R (W. t. M.)		"	Very sol.	"	
Victoria-blue B (Bad.), on China-clay or green-earth		"	Fairly sol.	Fairly sol.	
Victoria pure blue (Bad.), on green-earth		"	"	"	
Methylene-blue R (M. L. Br.), precipitated by tannin		"	"	Very sol.	
Methylene-blue BG (Bad.), precipitated by tannin		"	"	"	
Turquoise-blue BB (Bay.), precipitated by tannin		Traces	"	Fairly sol.	
Turquoise-blue G (Bay.), on China-clay		"	Very sol.	Very sol.	
Fast navy-blue R (Oehl.), precipitated by tannin or on China-clay		Insol.	Fairly sol.	"	
Green lakes containing :		Acid-green extra conc. B (Cass.)	Traces	"	"
		Neptune-green SBN (Bad.)	"	"	"
	Brilliant-green	} on China-clay or green-earth, and precipitated by tannin	Insol.	"	
	Malachite-green		Traces	"	

TABLE IX.

CLASS VI.—PRECIPITATED COAL-TAR COLOURS, INSOLUBLE IN HOT WATER AND ACETIC ACID, SOLUBLE IN ALCOHOL.

	Colouring Matter.	Hot Water.	Alcohol.	Acetic Acid.
Yellow and brown lakes containing :	Pigment - chrome - yellow L in pulp (M. L. Br.)	Insol.	Fairly sol.	Insol.
	Manchester-brown EE on China-clay (Cass.)	"	Very sol.	Traces
	Chrysoïdin O on China-clay	"	"	"
	Vesuvïn BL (Bad.) on China-clay	"	"	"
Orange and red lakes containing :	Pigment-orange R in pulp ; brilliant red for lakes in pulp (M. L. Br.)	"	Fairly sol.	"
	Autol-orange in pulp (Bad.)	"	"	Insol.
	Permanent orange R in pulp (Berl.)	"	"	Traces
	Chloramine-orange G (Bay.)	Traces	"	"
	Pigment-red G, B in pulp (M. L. Br.)	Insol.	"	Insol.
	Autol-red in pulp, all brands (Bad.)	"	"	"
	Pigment Bordeaux R, N in pulp (M. L. Br.)	"	"	"
	Pigment purple A in pulp (M. L. Br.)	"	"	"
	Eosine H 7 G, 442 N (Bad.)	"	"	Traces
	Eosine 5 B (M. L. Br.)	"	"	"
	Phloxine BA extra, GA extra O (M. L. Br.)	"	"	Insol.
	Rose Bengale NTO (Bad.)	Traces	"	"
	Safranine BS, S 150 (Cass.) on China-clay	Insol.	"	Traces

TABLE X.

CLASS VII.—PRECIPITATED COAL-TAR COLOURS, INSOLUBLE IN HOT WATER AND ALCOHOL, SOLUBLE IN ACETIC ACID.

	Colouring Matter.	Hot Water.	Alcohol.	Acetic Acid.
Yellow lakes containing :	Quinoline-yellow	Traces	Traces	Fairly sol.
	Direct yellow R extra ; Chloramine yellow GG (Bay.)	"	"	"
Orange and red lakes containing :	Mikado-orange 4 R (Mühl.)	Insol.	Insol.	"
	Vermilion-scarlet G (Beyer & Kegel)	Traces	"	"
	Ponceau for lakes B extra (Mühl.)	Insol.	"	"
	Ponceau 5 R (M. L. Br.)	Traces	Traces	"
	Ponceau for lakes 3 RN (Bad.)	"	Insol.	"
	Ponceau 4 R (Berl.)	"	Traces	Very sol.
	Ponceau 3 R (W. t. M.)	"	"	Fairly sol.
	Helio fast red G in pulp (Bay.)	Insol.	"	"
	Fast red BT (Bay.)	Traces	"	Very sol.
	Rubin N (Berl.) on green-earth	Insol.	"	Fairly sol.
Safranine M _{ooo} (Oehl.) on China-clay	"	"	"	

	Colouring Matter.	Hot Water.	Alcohol.	Acetic Acid.
Violet lakes containing :	Methylene-violet RRA (M. L. Br.) precipitated by tannin or on green-earth	Insol.	Traces	Very sol.
	Methylene-violet BN (M. L. Br.) on China-clay or green-earth	"	"	"
	Rhodulin - violet (Bay.) precipitated by tannin or on China-clay	"	"	"
	Fast acid-violet B (M. L. Br.)	"	"	"
	Acid-violet 4 R (Bad.)	"	"	Fairly sol.
	Guinea-violet 4 B (Berl.)	"	"	"
Blue lakes containing :	Blue for lakes CB (Cass.)	Traces	"	"
	Cotton-blue O, sol. in water (M. L. Br.)	Insol.	"	"
	Pure blue O (M. L. Br.)	"	"	"
	Neptune-blue B (Bad.)	Traces	"	Very sol.
	Brilliant benzo blue 6 B (Bay.)	Insol.	Insol.	Fairly sol.
	New patent blue GA (Bay.)	Traces	Traces	"
	Blue BSHL, Cotton-blue OO (Oehl.)	Insol.	Insol.	"
	Victoria pure blue (Bad.) on China-clay	"	Traces	Very sol.
	Methylene-blue R (M. L. Br.) on China-clay	"	"	"
	Methylene-blue BG (Bad.) on China-clay	"	Insol.	Fairly sol.
	Methylene-blue B, BH (Bad.) precipitated by tannin	"	Traces	"
	Turquoise-blue BB (Bay.) on China-clay	"	"	Very sol.
	New methylene - blue F (Bay.) on China-clay	"	Insol.	Fairly sol.
	New methylene-blue BB (Bay.) precipitated by tannin	"	Traces	Very sol.
New methylene-blue GG (Cass.), precipitated by tannin or on China-clay	"	Insol.	Fairly sol.	
Green lakes containing :	Acid-green extra conc. (Cass.)	Traces	"	"
	Green for lakes BW (Cass.)	"	Traces	Very sol.
	Acid-green D conc. (M. L. Br.)	"	Insol.	Fairly sol.
	Blue-green S (Bad.)	"	Traces	"
	Light green SF, SL, etc. (Bad.)	"	Insol.	"
	Neptune-green S, SB (Bad.)	Insol.	Traces	"
	Guinea-green 12157 (Berl.)	Traces	"	"
	Naphthol-green	Insol.	Insol.	Very sol.

TABLE XI.

CLASS VIII.—COAL - TAR COLOURS, THE PRECIPITATIONS OF WHICH ARE INSOLUBLE IN HOT WATER, ALCOHOL, AND ACETIC ACID.

	Colouring Matter.	Hot Water.	Alcohol.	Acetic Acid.
Yellow and brown lakes containing :	Pigment-chlorine GG in pulp (M. L. Br.)	Insol.	Traces	Traces
	Milling-yellow O (Cass.)	"	"	"
	Mikado golden-yellow G, 2 G, 4 G, 6 G, 8 G (Mühl.)	Traces	Insol.	"
	Benzo chrome-brown G, R (Bay.)	Insol.	Traces	"
	Chloramine-brown G (Bay.)	"	"	"
	Phosphine G, 2 G, 3 R on China-clay	"	"	"
Orange and red lakes containing :	Pluto-orange G (Bay.)	Traces	"	"
	Ponceau for lakes G extra (Mühl.)	Insol.	Insol.	"
	Ponceau 3 RL (M. L. Br.)	"	"	"
	Brilliant carmine L (Bad.)	Traces	"	"
	Astacin-red B, Lithol-red R in pulp (Bad.)	"	"	Insol.
	Brilliant helio-purpurin B (Bay.)	"	Traces	Traces
	Pigment-scarlet 3 B	"	"	"
	Red for lakes A 101 (Berl.)	"	"	"
	Bordeaux B for lakes (Berl.)	Insol.	Insol.	Insol.
	Benzo fast scarlet 4 BS (Bay.)	Traces	Traces	Traces
	Benzo fast scarlet 5 BS (Bay.)	Insol.	Insol.	Insol.
	Benzo purpurin 4 B (Bay.)	Traces	Traces	"
	Azophloxine 2 G (Bay.)	"	"	Traces
	Erythrosine, all brands	"	"	"
	Phloxine BA extra O (M. L. Br.)	"	"	Decolorised
	Rose Bengale NT (Bad.)	"	"	Partly decolorised
		Safranine BS, S 150 (Cass.) on green-earth	Insol.	"	Traces
	New magenta O (M. L. Br.) on green-earth	"	"	"
	Tannin - heliotrope (Cass.) on green-earth	"	"	"
	Rhodulin-red G, brilliant rhodulin-red B on green-earth (Bay.)	"	"	"
Violet lakes containing :	Cresyl fast violet 2 B (Mühl.) on China-clay or green-earth	"	Insol.	"
	Rhodulin - violet (Bay.) on green-earth	"	Traces	"
	Rhodulin-heliotrope (Bay.) on green-earth	"	"	"
	Violet for lakes R (Berl.)	"	Insol.	Insol.

	Colouring Matter.	Hot Water.	Alcohol.	Acetic Acid.
Blue lakes containing :	Dianil-blue, all brands (M. L. Br.)	Insol.	Insol.	Traces
	Helio fast blue BL, SL (Bay.)	"	Traces	"
	Benzo fast blue BN (Bay.)	"	Insol.	"
	Benzo fast blue 5 R (Bay.)	"	"	Insol.
	Helio-azurine RL (Bay.)	"	"	"
	Brilliant azurine B, 5 G (Bay.)	"	"	"
	Benzo-azurine G, Benzo pure blue (Bay.)	"	"	"
	Benzo chrome-black-blue B (Bay.)	"	"	"
	Victoria - blue B, Victoria pure blue (Bad.) precipitated by tannin	"	Traces	Traces
	New methylene-blue GG (Cass.) on green-earth	"	Insol.	Insol.
	Capri blue GN (Mühl.) on China-clay or precipitated by tannin	"	Traces	Traces
	Capri blue GN (Mühl.) on green-earth	"	Insol.	Insol.
	Methylene - blue R (M. L. Br.) on green-earth	"	Traces	"
	Methylene - blue BB (M. L. Br.) on China-clay or precipitated by tannin	"	"	"
	Methylene blue BB (M. L. Br.), on green-earth	"	Insol.	"
	Methylene blue BG, BH (Bad.), on green-earth or China-clay	"	"	"
	Methylene - blue B (Bad.) on China-clay	"	"	Traces
	Methylene - blue B (Bad.) on green-earth	"	"	Insol.
	Turquoise - blue G, BB (Bay.) on green-earth	"	Traces	Traces
	Turquoise - blue G (Bay.) precipitated by tannin	Traces	"	"
	New methylene-blue F, FR (Bay.) precipitated by tannin	"	"	"
	New methylene-blue FR (Bay.) on China-clay	Insol.	"	"
New methylene-blue FR, F, BB (Bay.) on green-earth	"	Insol.	Insol.	
New methylene-blue BB (Bay.) on China-clay	"	Traces	Traces	
Fast navy-blue R (Oehl.)	"	"	Insol.	
Green lakes containing :	Benzo dark green GG (Bay.)	"	"	Traces
	Benzo-green G	"	Insol.	Insol.

The classification of the precipitated coal-tar colours according to their degree of solubility in hot water, alcohol, and acetic acid must always be considered a kind of preliminary analysis of lakes from coal-tar colours, as the test for solubility is sufficient to separate them into distinct groups. In some cases the number in one group is very small, and sometimes these form classes distinguished by their shades (Classes II. and IV.). On the other hand, substances agreeing in solubility character may be so numerous that it is inconvenient to classify them on this basis (for instance, I. and

VII.). In practice, such cases are more easily dealt with otherwise. The remedy is to use an additional solvent which will give distinctive reactions for the individual substances, *e.g.* strong sulphuric acid and strong soda lyes (40° Bé.).

Most lakes containing coal-tar colours are easily decomposed by strong sulphuric acid and their colouring principle thereby readily isolated. The precipitation of the coal-tar colours, with very few exceptions, is associated with such a change of colour as to give rise to easily recognisable groups. For instance, some yellow coal-tar colours become crimson or indigo-blue when treated with strong sulphuric acid; some red coal-tar colouring matters turn blue or green; blue colouring matters turn green or yellow; while violet ones become reddish. All these colours, whether red, blue, yellow, or green, which acquire a different colour when treated with sulphuric acid form one group, sub-divisible into sections additional to the eight classes already noticed, but comprising some of the items included in those classes. In each of the eight classes (I.-VIII.) smaller groups may thus be formed, consisting of a few substances only. Thus the behaviour with strong sulphuric acid helps to differentiate between the members of a large class. An example, given later, will prove the feasibility of the method.

If sulphuric acid alone does not give a distinctive reaction, a solution of caustic soda must be employed. As the coal-tar colours for lakes differ in reaction according to the strength of this solution, solutions of decidedly different strengths are required. From various trials made by the author, a solution of sp. gr. 1.383 (40° Bé.) is recommended.

Although weak caustic soda, like strong sulphuric acid, decomposes almost all coal-tar colour precipitates, the 40° Bé. strength generally produces a change of their shade only, without effecting complete decomposition. In many cases the supernatant liquid (top liq. in these tables) is rendered colourless or has a faint tinge, generally of a shade different from that of the original lake. The shade changes rarely occur immediately, but generally take place after a definite interval of time, which may sometimes be hours—a fact utilised for diagnostic purposes.

Some powdered lakes are difficult to mix with strong caustic soda; but there is no difficulty if the powder is moistened with water and shaken well before adding the caustic soda.

TABLE XII.

REACTIONS OF THE COAL-TAR COLOUR LAKES WITH SULPHURIC ACID 66° B.

The Lake becomes coloured with H ₂ SO ₄ 66° B.:	Coal-tar Colouring Matter.	Ether Zone.	Alcohol.	Acetic Acid.	Caustic Soda.		SnCl ₂ + HCl.	
					12° B.	40° B.		
Grey (decoloured)	Neptune-blue B (Bad.) New patent blue GA (Bayer)	... ...	Slightly sol. Traces	Very sol. Fairly sol.	... Partly decomposed	Decolourised Brownish	Decolourised (or discoloured where shade given). Supernatant Liquid.	
Straw-yellow	Patent blue A, L (M. L. Br.) Thioflavin T (Cass.)	... ...	Fairly sol. "	" "	" Decomposed	Paler Decolourised	In 6 days Orange-red	Bluishgreen. Greenish blue. Pale bluish. Colourless.
	Citronin (Mühl.) Naphthol-yellow S	Sulphur-yellow "	Slightly sol. Fairly sol.	Very sol. Fairly sol.	Dissolves "	Dissolves "	... In 5 hours	Yellow sol. Pale yellow solution. Yellowish.
Greenish yellow	Auramine O	"	Very sol.	Very sol.	Ochre-like	Coloured	"	"
	Blue for lakes CB (Cass.)	...	Slightly sol.	Fairly sol.	Partly decolourised Red-violet	Decolourised	In 15 days	Yellowish green. Brownish yellow.
Lemon-yellow	Helio fast blue SL (Bayer)	...	Traces	Slightly sol.	Red-violet	Red-violet	In 48 hours	Brownish yellow. Pale yellowish. Colourless.
	Guinea-green 12157 (Bayer)	...	"	Fairly sol.	Decolourised	Yellower	In 10 days	"
Lemon-yellow	Fast-green, bluish (Bayer)	...	Slightly sol.	"	Decomposed	Red-violet	"	"
	Pigment chrome - yellow (M. L. Br.) Eosine, yellowish brands	Lemon-yellow "	Fairly sol. Greenish fluoresc. Very sol.	... Golden-yellow sol. Very sol.	Redder Decomposed	Decomposed	Orange-yellow In 4 days	" "
Golden-yellow	Brilliant green	...	Very sol.	Very sol.	Dissolves Sol. (orange)	Decolourised	In 3 hours In 20 mins.	" "
	Sulphon-yellow R (Bayer) Cloth-yellow G, R (Oeh.)	Sulphur-yellow "	Slightly sol. Slightly sol.	Fairly sol. Fairly sol.	Decomposed	Decomposed	Yellowish orange	"
Eosine, blue brands		Brownish yellow	Greenish fluoresc.	Slightly sol.	Decomposed	Decomposed	Yellowish orange	"

Reddish orange	Orange ENL (Class.)	Brownish yellow	Fairly sol.	"	...	In 2 hours	"
	Ponceau 4 BGL (Berl.)	Lemon-yellow	Slightly sol.	"	...	In 6 hours	"
	Rose Bengale NTO (Bad.)	Orange	Fairly sol.	"	Dark red-violet	Pale pink	"
	Acid-green L (Bayer)	...	Traces	Fairly sol.	Greenish grey	In 14 days	"
Brownish orange	Quinoline-yellow	...	Slightly sol.	"	Leather-col.	...	Pale yellowish. Colourless.
	Orange for lakes ON (Bad.)	Bright lemon-yellow	Fairly sol.	"	Decomposed	In 28 hours	"
	Excelsior scarlet IN (Class.)	...	Slightly sol.	"	Browner	In 27 hours	"
	Scarlet GL (Berl.)	Golden-yellow	Fairly sol.	"	"	In 5 days	"
	Methyl-violet BB (M. L. Br.)	Reddish brown	Very sol.	"	Brown	Light greenish	Grass-green.
	Acid-violet 3 RA (M. L. Br.)	...	Fairly sol.	Fairly sol.	Brighter	In 120 hours	Red-violet.
	Acid-violet N (M. L. Br.)	...	Slightly sol.	"	"	pale pink	"
	Guinea-violet 4 B (Berl.)	...	"	"	"	In 75 hours	"
	Turquoise-blue BB (Bayer)	...	Fairly sol.	"	Decomposed	In 66 hours	Pale violet-blue.
	Acid-green extra conc. (Class.)	...	Insol.	"	Brighter	In 6 days	Greenish yellow.
Yellowish ponceau	Acid - green D conc. (M. L. Br.)	...	"	"	Partly decomposed	Light blue	Blue green.
	Light green SF yellowish (Bad.)	...	"	"	Dark green	...	"
	Light green SL (Bad.)	...	"	"	Bluer	...	"
	Neptune-green SG (Bad.)	...	Fairly sol.	"	Duller	...	"
	Naphthol-green	...	Insol.	"	Grey-green	...	"
	Brilliant acid - green 6 B (Bayer)	...	Fairly sol.	Very sol.	Decomposed	In 6 days	Pale greenish blue.
	Victoria pure blue	...	Traces	Fairly sol.	Decolorised	Brighter	Colourless.
	Mikado golden-yellow 6 G (Mühl.)	...	Insol.	Slightly sol.	Brown-red	Olive-green	Pale yellowish.
	Mordant-yellow G (Bad.)	Pale sulphur-yellow	Traces	Red-brown	Decomposed	In 3 weeks	Colourless.
	Brilliant orange G (M. L. Br.)	Bright lemon-yellow	Fairly sol.	Fairly sol.	Scarlet	In 1 hour	"
Xylidin ponceau R (Leipzig)	...	"	Very sol.	Brighter	In 25 hours	"	
						In 5 hours	"

Brilliant double scarlet 3 R (Bayer)	...	Fairly sol.	"	"	Rust-brown	In 10 hours	"
Pigment - red G in pulp (M. L. Br.)	Lemon-yellow	"	Insol.	"	Browner	In 3 months	"
Autol - red BGL in pulp (Bad.)	"	"	Traces	"	"	"	"
Astacin-yellow R (Bad.)	...	Slightly sol.	Fairly sol.	Partly decomposed	Bright yellow	Gelatinised	Lemon-yellow.
Pigment - chlorine GG (M. L. Br.)	...	Traces	Traces.	...	...	In 1 hour	Pale yellowish.
Mikado-yellow 8 G (Mühl.)	...	...	Slightly sol.	Decomposed	Decomposed	In 3 weeks	Colourless.
Paper-yellow GG (Bayer)	...	Fairly sol.	Very sol.	"	Red-brown	In 48 hours	"
Ponceau GRI (M. L. Br.)	Faintly yellowish	Slightly sol.	Fairly sol.	"	Browner	In 9 days	"
Mikado golden - yellow G (Mühl.)	...	...	...	Redder	"	In 3 weeks	"
Direct yellow R extra (Bayer)	...	Traces	Very sol.	Decomposed	Decomposed	In 60 hours	"
Manchester brown EE (Cass.)	...	Very sol.	Slightly sol.	Brighter	Brownish orange	In 40 hours	"
Chrysoidine O	...	"	"	Decolorised	Decolorised	"	"
Vesuvine 4 GB (M. L. Br.)	...	"	Fairly sol.	Brighter	Brownish orange	"	"
Bismarck-brown F (Bayer)	...	Fairly sol.	Slightly sol.	Lemon-yellow	Golden-yellow	In 36 hours	"
Vermilion-scarlet G (Leipzig)	...	...	Fairly sol.	Decomposed	Partly decomposed	In 7½ hours	"
Ponceau for lakes G extra (Mühl.)	...	...	Traces	"	Decomposed	In 8 days	"
Ponceau GRLH (M. L. Br.)	Golden-yellow	Fairly sol.	Very sol.	"	Browner	In 7 days	"
Ponceau for lakes LGN (Bad.)	...	"	"	"	Bluer	In 9 hours	"
Ponceau GL (Berl.)	Lemon-yellow	Slightly sol.	Slightly sol.	"	Browner	In 8 days	"
Ponceau RRL (Berl.)	...	...	Very sol.	Partly decomposed	"	In 10 days	Pale pink.
Helio-purpurin 3 BL (Bayer)	Orange-red	Fairly sol.	Fairly sol.	Decomposed	Partly decomposed	In 30 mins.	Colourless.
Acid-violet A 2 R (M. L. Br.)	...	"	"	"	Carmoisin-red	...	Reddish violet.
Fast acid - violet RO (M. L. Br.)	...	"	"	"	"	...	Red-violet.
Acid-violet 4 R (Bad.)	...	Slightly sol.	"	Partly decomposed	Decomposed	...	"

The Lake becomes coloured with H_2SO_4 66° B.	Coal-tar Colouring Matter.	Ether Zone.	Alcohol.	Acetic Acid.	Caustic Soda.		SnCl ₂ + HCl.
					12° B.	40° B.	
Brown-red	Opal - blue, bluish (M. L. Br.)	...	Slightly sol.	Fairly sol.	Decomposed	Colcothar-like	Decolorised, or discoloured where colour given.
	Opal - blue, reddish (M. L. Br.)	...	"	"	"	"	"
	Pure blue O (M. L. Br.)	...	...	"	Brick-red	Partly decomposed	"
	Alkali blue, all brands	...	Very sol.	Very sol.	Brown-red	Brown-red	Colourless.
	Blue for lakes I (Bad.)	...	Fairly sol.	"	Red-brown	Maroon	...
	Water-blue 3 R (Weiler)	...	Very sol.	"	Red-violet	Brown-red	...
	Blue BSHL (Oeh.)	...	...	...	Brown-red	Dark brown-red	...
	Cotton-blue OO (Oeh.)	...	...	...	Purple-red	Dark purple-red	...
	Victoria-blue B (Bad.)	...	Traces	Traces	Partly decomposed	Partly decomposed	Greener
	New methylene - blue GG (Class)	Faintly reddish	...	...	Fairly sol.	Black-brown	In 24 hours
Carmine, yellowish	Orange II. 35462 (Weiler)	Lemon-yellow	Fairly sol.	Very sol.	Decomposed	Carmine-red	"
	Orange II. R (M. L. Br.)	Golden-yellow	"	Slightly sol.	"	"	"
	Ponceau II. RL (M. L. Br.)	...	Traces	Fairly sol.	"	...	"
	Palatine-ponceau G (Bad.)	Pale yellowish	Slightly sol.	"	"	Browner	"
	Ponceau BN (Bad.)	Lemon-yellow	"	"	"	"	"
	Ponceau 3 R (Weiler)	...	Traces	"	"	"	"
	Ponceau 2 R (Weiler)	Lemon-yellow	Fairly sol.	"	"	...	"
	Guinea-red 4 R (Berl.)	...	Slightly sol.	"	"	Partly decomposed	"
	Ponceau 3 RL (Berl.)	...	...	Fairly sol.	Fairly sol.	decomposed	"
	Brilliant red for lakes in pulp (M. L. Br.)	Orange-red	...	Fairly sol.	Traces	"	"
Carmine, reddish	Citronin G ^{ooo} (Oeh.)	Lemon-yellow	Very sol.	Fairly sol.	Yellow-brown	Dark brown	Golden-yellow.
	Orange II. (Bad.)	Bright lemon-yellow	Fairly sol.	Very sol.	Decomposed	Carmine	Colourless.
	Mandarin RL (Berl.)	Lemon-yellow	"	Fairly sol.	Partly decomposed	Ponceau-red	"

Pigment-orange R in pulp.	Golden-yellow	"	Slightly sol.	Traces sol.	Brown-red	Brighter	Colourless.
Brilliant scarlet G (Cass.)	"	"	Very sol.	Decomposed	"	In 9 hours	"
Ponceau 3 RL (M. L. Br.)	"	"	Traces	"	"	In 5 days	"
Ponceau G for lakes (Bad.)	Lemon-yellow	Slightly sol.	Fairly sol.	"	Brown-jelly	In 12 days	"
Ponceau 44099 (Berl.)	"	"	Very sol.	"	Browner	In 3 days	"
Curcumein GG (Leipzig)	Sulphur-yellow	Fairly sol.	"	Partly decomposed	Dark brown	In 8 days	Yellowish.
Violet for lakes R (Berl.)	"	"	"	Bluish pink	Carmine	In 75 hours	Yellowish pink.
Orange extra (Cass.)	Golden-yellow	Fairly sol.	Very sol.	Decomposed	"	In 1½ hours	Colourless
Citronin Reoo (Oeh.)	Lemon-yellow	Very sol.	Fairly sol.	Yellow-brown	Dark brown	In 16 days	Sulphur-yellow.
Orange II. extra conc. (Weiler)	Golden-yellow	Fairly sol.	Very sol.	Decomposed	Carmine	In 1½ hours	Colourless.
Orange G extra (Leipzig)	"	"	"	"	"	In 2 hours	"
Orange II. (Cass.)	"	"	"	"	"	In 1 hour	"
Orange A (Mühl.)	"	"	"	Partly decomposed	"	In 2 hours	"
Mandarin G (Berl.)	"	"	Fairly sol.	"	"	In 3 hours	"
Permanent orange R (Berl.)	"	"	Traces	"	Red-brown	In 9 days	"
Ponceau for lakes GG (Cass.)	Faintly yellowish	"	Fairly sol.	Decomposed	"	In 8½ hours	"
Ponceau for lakes B extra (Mühl.)	"	"	"	Partly decomposed	Decomposed	In 18 days	"
Ponceau 3 RN (Bad.)	"	"	"	Decomposed	"	In 11 days	"
Ponceau 2 RX (Leipzig)	"	Slightly sol.	"	"	"	In 32 hours	"
Ponceau GRL (M. L. Br.)	Lemon-yellow	Fairly sol.	Very sol.	"	"	In 8 days	"
Ponceau RL (M. L. Br.)	"	Traces	Slightly sol.	"	"	"	"
Astacin-red B (Bad.)	"	"	"	"	Ponceau-red	In 14 days	"
Ponceau RL (Berl.)	Faintly yellowish	Slightly sol.	Very sol.	"	Browner	In 26 hours	"
Pigment - scarlet 3 B (M. L. Br.)	"	Traces	Traces	"	Decomposed	In 11 days	"
Chloramine-yellow M (Bayer)	"	Very sol.	Very sol.	"	Browner	Dark brown	"
Ponceau for lakes LN (Bad.)	Lemon-yellow	Slightly sol.	Fairly sol.	"	"	In 7 hours	Colourless.
Azo-yellow O (M. L. Br.)	Sulphur-yellow	Very sol.	"	Leather-coloured	Black-brown	In 30 days	Brownish.
Orange RL (Leipzig)	Golden-yellow	Fairly sol.	Very sol.	Decomposed	Yellow-brown	In 10 hours	Colourless.
Orange II. L (M. L. Br.)	"	"	Fairly sol.	Carmine	Carmine	In 30 mins.	"

Carmine, bluish

Scarlet-red

Purple-red

Raspberry-red

Carmoisin, reddish

The Lake becomes coloured with H_2SO_4 66° B.	Coal-tar Colouring Matter.	Ether Zone.	Alcohol.	Acetic Acid.	Caustic Soda.		SnCl ₂ + HCl.	
					12° B.	40° B.		
Carmoisin, reddish	Orange II. B (Bayer)	Bright lemon-yellow	Fairly sol.	Fairly sol.	Decomposed	Ponceau-red	In 1½ hours Colourless.	
	Vermilion-scarlet R (Leipzig)	...	...	"	"	Partly decomposed	In 10 days "
	Brilliant crocein BB (M. L. Br.)	Faintly yellowish	Slightly sol.	"	"	Decomposed	In 75 hours "	
	Brilliant acid - carmine B (Oeh.)	...	"	"	"	"	In 6 days "	
	Benzo fast scarlet 4 BS (Bayer)	...	Traces	Traces	Partly decomposed	Red-brown	In 4 days "	
	Chromotrop 6 B (M. L. Br.)	...	"	Very sol.	Decomposed	Decomposed	In 10 days "	
	Brilliant crocein 3 B (Bayer)	...	Fairly sol.	Fairly sol.	"	Red-brown	In 30 mins. "	
	Brilliant crocein B (Cass.)	...	"	Traces	"	Browner	In 8 hours "	
	Autol-red BL (Bad.)	Lemon-yellow	"	...	...	...	...
	Pigment-purple A in pulp (M. L. Br.)	Brownish orange	"	...	...	...	...
	Wool-blue N (Bayer)	...	Slightly sol.	Fairly sol.	Fairly sol.	Decomposed	Red-violet	In 3 months Colourless.
	Permanent red 6B (Berl.)	...	Fairly sol.	Fairly sol.	Very sol.	...	Blue-green	Green.
	Red for lakes A 101 (Berl.)	Pale pink	Slightly sol.	Decomposed	...	Colourless.
Bordeaux-red for lakes B (Berl.)	...	...	...	Traces	...	Carmine	"
Carmoisin, bluish	Brilliant carmine L (Bad.)	...	Traces	Slightly sol.	Partly decomposed	Partly decomposed	In 7 days "	
	Brilliant crocein M (Cass.)	...	Fairly sol.	Fairly sol.	Decomposed	Deep brown-red	In 60 hours "	
	Brilliant crocein B (M. L. Br.)	Lemon-yellow	Slightly sol.	"	"	Partly decomposed	In 75 hours "	
	Brilliant acid - carmine G (Oeh.)	...	"	"	"	"	In 5 days "	
	Benzo fast scarlet 5 BS (Bayer)	...	...	...	Partly decomposed	"	In 4 days "
Carmoisin, brownish	Pigment-red B in pulp (M. L. Br.)	Lemon-yellow	Fairly sol.	Traces	...	Browner	In 8 days "	
	Ponceau for lakes R (Cass.)	...	"	Very sol.	Decomposed	Deep brown-red	In 6½ hours "	

Ponceau for lakes RZ (Bad.)	...	Traces	Fairly sol.	Ponceau-red	In 5 days	"
Helio-purpurin 5 BL (Bayer)	Orange-red	Fairly sol.	"	Brown-red	In 20 mins.	"
Brilliant acid - carmine 6 B (Oeh.)	...	Slightly sol.	"	Brighter	In 5 days	"
Indian-yellow R (Bayer)	Lemon-yellow	Very sol.	Very sol.	Nearly black	In 72 hours	Brownish yellow.
Chrysohemlin G (Bayer)	...	"	Traces	Orange-red	In 5-10 mins.	Colourless.
Paper-yellow A (Bad.)	...	Fairly sol.	Very sol.	Ponceau-red	In 1 hour	"
Paper-yellow 3 G (Bad.)	...	"	Slightly sol.	Browner	In 30 days	Brownish.
Paper-yellow RR (Bad.)	Sulphur-yellow	Very sol.	Fairly sol.	Greenish-brown	In 2½ hours	Colourless.
Victoria - yellow conc. (M. L. Br.)	...	"	"	...	In 30 hours	"
Metanil - yellow 26060 (Weiler)	Faintly yellowish	Fairly sol.	"	Partly decomposed	In 3 weeks	"
Erythrine X for lakes (Bad.)	...	Traces	Very sol.	Decomposed	In 5 days	"
Ponceau BO extra (Berl.)	...	Fairly sol.	Very sol.	Partly decomposed	In 74 hours	"
Fast red E conc. 130 (Leipzig)	...	"	Fairly sol.	Rust-brown	In 1 hour	"
Brilliant crocein B ^{oo} (Class.)	...	"	"	Decomposed	In 10 hours	"
Brilliant crocein 5 B (M. L. Br.)	...	Slightly sol.	"	"	In 10½ days	"
Brilliant crocein bluish (M. L. Br.)	...	"	"	"	In 12 hours	"
Brilliant crocein yellowish	...	"	"	"	In 28 days	"
Fast brown GR (Berl.)	Golden-yellow	Fairly sol.	"	Red-brown	"	"
Curcumein ff. (Leipzig)	Lemon-yellow	"	"	Greenish black	"	"
Brilliant crocein 3 B conc. 20712 (Bayer)	...	"	"	Decomposed	In 30 mins.	"
Red for lakes P in pulp (M. L. Br.)	...	"	"	Blue-black	In 24 hours	Pale yellowish.
Lithol-red R in pulp (Bad.)	...	"	"	...	In 75 hours	Colourless.
Autol-red GL in pulp (Bad.)	Yellow-orange	Fairly sol.	...	Browner	...	"
Pyramine-yellow G (Bad.)	...	"	Slightly sol.	Redder	In 45 mins.	Colourless.
Metanil-yellow extra (Berl.)	Pink	Very sol.	Very sol.	Greenish brown	In 30 hours	Pale yellowish.
Metanil-yellow extra conc. (Weiler)	Faintly yellowish	"	"	...	"	"
Crystal - ponceau 6 R (M. L. Br.)	...	Fairly sol.	Fairly sol.	Decomposed	In 12 days	Colourless.
Autol-red RLP in pulp (Bad.)	Brownish orange	"	"	...	...	"

Violet, reddish

Violet, bluish

The Lake becomes coloured with H_2SO_4 , 66° B.	Coal-tar Colouring Matter.	Ether Zone.	Alcohol.	Acetic Acid.	Caustic Soda.		Decolorised, or discoloured where colour given.	$SnCl_2$ + HCl.
					12° B.	40° B.		
Violet, bluish	Pigment - Bordeaux R (M. L. Br.)	Brownish orange	Fairly sol.	Fairly sol.	...	...	...	...
Bordeaux-red, reddish	Pluto-orange G (Bayer)	...	Slightly sol.	Slightly sol.	Partly decomposed	Ponceau-red	In 65 hours	Colourless.
	Ponceau for lakes L (Mühl.)	...	...	Fairly sol.	Decomposed	Partly decomposed	In 6 weeks	"
	Brilliant red R for lakes (Bad.)	...	Fairly sol.	"	"	"	In 11 days	"
Bordeaux-red, bluish	Fast orange O (M. L. Br.)	Lemon-yellow	"	Slightly sol.	Red-brown	Reddish brown	In 2 hours	Pale yellowish.
Bordeaux-red, brownish	Ponceau 4 R (Berl.)	...	Slightly sol.	Very sol.	Partly decomposed	Partly decomposed	In 9 days	Reddish.
	Fast acid-violet B (M. L. Br.)	...	"	"	"	Nearly black	Bluer	Red-violet.
Reddish blue	Metanil-yellow PL (Bad.)	Sulphur-yellow	Very sol.	"	...	Brighter	In 1 hour	Greenish.
Prussian-blue	Mikado-orange 4 R (Mühl.)	...	...	Fairly sol.	Redder	Browner	In 72 hours	Colourless.
	Ponceau 6 RB (Berl.)	...	Very sol.	Very sol.	Decomposed	"	In 6 days	"
	Bordeaux G double conc. (Leipzig)	...	"	"	"	"	In 79 hours	"
	Cloth-red O (M. L. Br.)	...	Fairly sol.	"	...	Dark brown	In 6½ days	"
	Benzo-purpurin 4 B (Bayer)	...	Slightly sol.	...	...	Carmine	In 45 mins.	"
	Chromotrop 10 B (M. L. Br.)	...	Fairly sol.	Very sol.	Decomposed	Decomposed	In 10 days	"
	Helio fast red G (Bayer)	...	Slightly sol.	Fairly sol.	...	...	In 6 days	"
Indigo-bluish	Mikado-orange 3 RO (Mühl.)	...	...	Traces	Redder	Browner	In 72 hours	"
	Congo-orange G (Bayer)	...	Slightly sol.	Fairly sol.	Partly decomposed	Scarlet-red	In 4 hours	"
	Fast red BN (Bad.)	...	Traces	Very sol.	Decomposed	Browner	In 8 days	"
	Fast red BT (Bayer)	Golden-yellow brownish	Slightly sol.	"	Partly decomposed	"	In 90 hours	"
	Helio-purpurin 10 BL (Bayer)	Pale pink	Fairly sol.	Fairly sol.	...	Redder	"	"

The Lake becomes coloured with H_2SO_4 66° B.	Coal-tar Colouring Matter.	Ether Zone.	Alcohol.	Acetic Acid.	Caustic Soda.		Decolorised, or discoloured where colour given.	$SnCl_2 + HCl$.
					12° B.	40° B.		
Dark bluish green	Fast navy-blue R (Oeh.)	...	Fairly sol.	Very sol.	Decomposed	Black-brown	In 36 hours	Colourless.
Bluish green	Safranine BS, S 150 (Cass.)	...	"	Fairly sol.	Red-brown	Browner	Red-violet	Bluish pink-red. Crimson. Reddish.
	Safranine M ^{ooo} (Oeh.)	...	"	Very sol.	Partly decomposed	Partly decomposed	"	"
	Tannin heliotrope (Cass.)	Ruby-red	Very sol.	"	Chestnut-brown	Chestnut-brown	"	Reddish violet.
	Rhodulin-red C (Bayer)	Brownish red	Fairly sol.	"	Partly decomposed	Partly decomposed	"	Red-violet.
	Brilliant rhodulin - red B (Bayer)	Bluish pink	"	"	Partly decomposed	Partly decomposed	...	Colourless.
	Methylene - violet RRA (M. L. Br.)	Ruby-red	Slightly sol.	"	"	"	In 72 hours	"
	Methylene-violet BN powder (M. L. Br.)	"	Fairly sol.	"	"	"	...	...
	Rhodulin-violet (Bayer)	"	Slightly sol.	"	"	"	...	...
Emerald-green	Ponceau 3 RB (Berl.)	Yellowish pink-red	Very sol.	"	"	Blackish	In 7 hours	Colourless.
	Ponceau 64580 (Berl.)	"	"	"	"	"	In 5 days	"
Pure green	Azo-carmin B in powder (Bad.)	...	Fairly sol.	Fairly sol.	Decomposed	...	In 24 hours: grey-violet	Dark brown-red.
Yellowish green	Phosphine 2 G (Berl.)	...	Slightly sol.	...	Greener	Greener	More violet	... Paler reddish.
	Leather-red R (Bayer)	Golden-yellow	Fairly sol.	Fairly sol.	Partly decomposed	Red-brown	In 10 days	Pale greenish. Golden-yellow.
	Navy-blue BN (Bad.)	...	"	Very sol.	Bluish grey	Decomposed	In 3 hours	Colourless. Bluish grey.
	Helio fast blue BL (Bayer)	...	Traces	Slightly sol.	Decomposed	Dark violet	In 20 hours	...
	Methylene-blue, all brands Green for lakes BW (Cass.)	...	Fairly sol. Slightly sol.	Very sol.	"	Decomposed	...	...
	Neptune-green SB (Bad.)	...	Traces	Fairly sol.	Brighter	Bluish grey	...	...

Guinea-green G (Berl.)	...	Fairly sol.	Traces	Duller	...	Yellowish grey.
Phosphine 3 R (Berl.)	...	Traces	...	Olive	...	...
Wool-blue (Berl.)	...	Fairly sol.	Very sol.	Decolorised	In 20 days	Pale bluish.
New methylene-blue (Bayer)	FR	Traces	Traces	Carmoisin-red	In 24-60 hours	Colourless.
Acid-green extra conc. B (Cass.)	B	Fairly sol.	Very sol.	Dirty green	...	...
Rhodulin-heliotrope (Bayer)	Red-violet	Very sol.	"	Black	In 72 hours	Red-violet.
Benzo fast blue 5 R	...	Traces	Traces	Red-brown	In 5 hours	Colourless.
Capri-blue GN (Mühl.)	...	Traces	Traces	Decolorised	In 41 hours	"
Chloramine-orange G (Bayer)	...	Slightly sol.	Slightly sol.	Brown-red	In 7 days	"
Fast red AN (Bad.)	Pale orange	Very sol.	Very sol.	Decomposed	In 60 hours	Palereddish.
Benzo fast blue BN (Bayer)	...	...	Traces	Partly decomposed	In 6 hours	...
Benzo chrome-black-blue B (Bayer)	...	...	...	Blue-black	In 60 hours	Colourless.
Benzo dark green GG (Bayer)	Greenish yellow	Traces	Traces	Black-green	In 20 hours	"
Benzo-green G (Bayer)	...	...	...	...	In 6 hours	Yellowish green.
Cresyl fast violet 2 B (Mühl.)	Lemon-yellow	Fairly sol.	Very sol.	Brown	In 66 hours	Violet.
Acid-violet 6 BN (Bad.)	...	"	Fairly sol.	Dirty	...	Pale
Cotton-blue O (water-soluble) (M. L. Br.)	...	...	"	Red-brown	...	red-violet.
Opal-blue bluish (M. L. Br.)	...	Slightly sol.	"	"	...	"
Water-blue R (M. L. Br.)	...	Fairly sol.	Very sol.	"	...	...
Rubin B (M. L. Br.)	Lemon-yellow	Very sol.	Fairly sol.	Rust-brown	Black	Greenish.
Formyl-violet S 4 B (Cass.)	...	Fairly sol.	"	Grey	In 60 hours	Pale violet.
Wool-blue (Berl.)	...	Very sol.	Very sol.	Decolorised	In 20 days	Reddish blue.

Moss-green

Blackish green

Blue-black

Reddish black

Red-brown

Yellow-brown

TABLE XIII.

REACTIONS OF THE COAL-TAR COLOUR LAKES WITH CAUSTIC SODA.

Group.	Caustic Soda 40° B.		Coal-tar Colouring Matter.	Caustic Soda 12° B.		
	Colour of the Lake.	Supernatant Liquid.		Colour.	Supernatant Liquid.	
1. Yellow lakes	No change	Colourless	Auramine	Ochre-like Redder	Colourless	
		"	Milling-yellow O (Cass.)			Pale golden-yellow.
		"	Metanil-yellow PL (Bad.)				Pale lemon-yellow.
	Redder	"	Metanil-yellow extra 26060 ¹ (Weiler)	"	"	
		"	Lemon-yellow	Brighter	Lively orange.	
		Colourless	Quinoline-yellow	Dull orange	Yellowish orange.	
	Orange	"	Pyramin-yellow G for lakes (Bad.)	No change	Colourless.	
		"	Chrysophenin G (Bayer)	Redder	Nearly colourless.	
		Ponceau-red	Mordant-yellow G (Bad.)	Yellow-orange	Yellow-orange.	
	Orange (brownish)	Ruby-red	Paper-yellow A (Bad.)	Decomposed.	Colourless.	
	Ponceau-red	Colourless	Paper-yellow 3 G (Bad.)	No change		Golden-yellow.
	Becomes browner	"	Chloramine-yellow GG, M (Bayer)				Redder
	Brown, nearly black	"	Indian-yellow R (Bayer)	Tobacco-brown	Brownish.	
		"	Paper-yellow RR (Bad.)	Decomposed.		
		"	Azo-yellow O (M. L. Br.), Citronin G ⁰⁰⁰ (Oeh.)	Greenish brown		Pale pink.
Brown, reddish	Nearly colourless	Paper-yellow GG, R (Bayer)	Completely decomposed.	Completely decomposed.		
	Dark golden-yellow	Mordant-yellow R (Bad.)	Brownish		Golden-yellow to blood-red.	
	Blood-red	Mikado golden-yellow (Oeh.), all brands				
Brown, greenish to reddish	Colourless	Victoria-yellow, conc. (M. L. Br.)	No change	Yellowish.		
	"	Metanil-yellow extra (Berl.)				
Greenish yellow	Brilliant green	Astacin-yellow (Bad.)	Decomposed.	Decomposed.		
	No effect	Pigment - chlorine in pulp (M. L. Br.)	No effect.			
		Pigment chrome - yellow L (M. L. Br.)				
2. Orange-red lakes	Carmine	Colourless	Orange II. 35462, II. extra conc. (Weiler)	Completely decomposed.		
			Orange II. G (Leipzig)			
			Orange extra, II. (Cass.)			
			Orange A (Mühl.)			

Group.	Caustic Soda 40° B.		Coal-tar Colouring Matter.	Caustic Soda 12° B.		
	Colour of the Lake.	Supernatant Liquid.		Colour.	Supernatant Liquid.	
Orange-red lakes	Carmine	Colourless	Orange II. L, II. R (M. L. Br.) Orange II. (Bad.) Mandarin G (Berl.) Orange RL (Leipzig)	Decomposed.		
	Dirty yellow-brown Ponceau-red	Colourless Pale yellowish Colourless	Brilliant orange G, R (M. L. Br.) Orange A extra (Bad.) Congo-orange G (Bayer) Mandarin RL (Berl.) Pluto-orange G (Bayer) Orange II. B (Bayer) Fast orange O (M. L. Br.) Chloramine-orange G (Bayer) Pigment - orange R in pulp (M. L. Br.) Permanent orange R in pulp (Berl.)	" " Partly decomposed. " Decomposed. " Partly decomposed. " Decomposed. " Partly decomposed. " Decomposed. " No effect.	" " Partly decomposed. " Decomposed. " Partly decomposed. " Decomposed. " No effect.	
	Chocolate-brown	" " " " "	Orange for lakes ON (Bad.) Autol-orange in pulp Orange ENL (Cass.)	Browner	Colourless, Decomposed. No effect. Decomposed.	
	No effect					
	3. Red lakes	Browner	Colourless	The most GG, G, R, and RR ponceau and scarlet brands of all makers	"	
		Deep red-brown	Colourless Bright brownish red to deep blackish brown	Brilliant crocein M (Cass.) Brilliant crocein 800, 1000, 9 B (Cass.) Brilliant crocein B, BB, 5 BR, yellowish and bluish (M. L. Br.) Brilliant crocein 3 B conc. 20712 and 3 B (Bayer)	" "	
		Reddish black	Colourless Nearly colourless " Deep ruby-red Pale yellow-brown	Ponceau 3 RB (Berl.) Ponceau B extra (M. L. Br.) Fast ponceau BN (Bad.) Ponceau BO extra (Berl.) Ponceau 64580 (Berl.)	Red-brown Red-brown Rust-brown	Ruby-red, Decomposed. Pale pink. Decomposed. Brown-red.
		Partly decomposed	Ruby-red " " "	Vermilion-scarlet R (Leipzig) Ponceau for lakes L (Mühl.) Acid-carmine G, B (Oeh.) Brilliant carmine R for lakes (Bad.)	Decomposed.	
			Red-brown Ruby-red Carmine Brownish orange "	Brilliant red G for lakes Fast red AV (Bad.) Ponceau 4 R (Berl.) Brilliant double scarlet 3 R (Bayer) Benzo fast scarlet 4 BS, 5 BS (Bayer)	Brick-red Brown-red Bluish	Ruby-red. Ruby-red. Ruby-red. Decomposed
			Brownish yellow	Leather-red R (Bayer)	Scarlet Tobacco-brown	Carmine. Brownish yellow.

Group.	Caustic Soda 40° B.		Coal-tar Colouring Matter.	Caustic Soda 12° B.		
	Colour of the Lake.	Supernatant Liquid.		Colour.	Supernatant Liquid.	
Red lakes	Partly decomposed	Opaque	Ponceau 5 R (M. L. Br.)	Decomposed.		
	Completely decomposed	Ponceau	Guinea-red 4 R (Berl.)	"		
		Carmine	Chromotrop 6 B, 10 B (M. L. Br.)	"		
	Brick-red Scarlet, later brown-red	"	Deep red-brown	Azo-phloxine 2 G (Bayer)	"	
		"	"	Ponceau for lakes G, B extra (Mühl.)	"	
		"	"	Erythrine X for lakes (Bad.)	"	
		"	Bluish violet	Chromotrop 8 B (M. L. Br.)	"	
		"	Yellow-red	Pigment-scarlet 3 B (M. L. Br.)	"	
		"	Red-brown	Crystal-ponceau 3 B (M. L. Br.)	"	
		"	Yellowish red	Astacin-red B (Bad.)	"	
		"	Brownish red	Brilliant helio - purpurin B (Bayer)	"	
		"	"	Helio-purpurin 5 BL (Bayer)	"	
		"	Yellow-orange, pale	Helio-purpurin 3 BL (Bayer)	"	
	Raspberry red	Colourless	Helio-purpurin 10 BL (Bayer)	Little effect.		
	Brownish	"	Palatine ponceau G for lakes (Bad.)	Decomposed.		
	Bordeaux-red	Red-violet	Benzo-Bordeaux 6 B (Bayer)	"		
	Bordeaux-red	Colourless	Bordeaux G, R, 0 (M. L. Br.)	"		
	Carmoisin-red	Yellow-orange	Bordeaux B for lakes (Berl.)	"		
	Carmine	Colourless	Benzo-purpurin 4 B (Bayer)	No effect.		
		"	Columbia fast scarlet 4 B (Berl.)	"		
	Rust-brown	Bright ruby-red	Fast red E conc. 130 (Leipzig)	"		
	Dark brown	Colourless	Cloth-red O (M. L. Br.)	Small effect.		
	Brown-red	"	Bordeaux double conc. (Leipzig)	Dull violet | Red-brown.		
	Bluish violet	"	Amaranth B (Cass)	Decomposed.		
	Black-blue	"	Crocein-scarlet 10 B (Bayer)	"		
	Brighter and yellow	"	Ponceau 3 RL (Berl.)	"		
	Much browner	"	Autol-red GL, BGL, BL in pulp (Bad.)	No effect.		
		"	Pigment-red B in pulp (M. L. Br.)	No change	Pale bluish pink-red.	
	Blue-black	Carmine	Red for lakes A 101 in pulp (Berl.)	Decomposed.		
		Colourless	Red for lakes P in pulp (M. L. Br.)	Red-brown	Bluish fluorescence.	
No change	Pale yellowish	Ponceau GL, 4 GBL (Berl.)	Decomposed.			
	"	Ponceau RL (M. L. Br.)	"			
	"	Ponceau GR (Weiler)	"			
	"	Xylidin scarlet R (Leipzig)	"			
	"	Ponceau 2 RX (Leipzig)	"			
	"	Ponceau 2 RL, 3 RL (M. L. Br.)	"			
	"	Azo-carmine B in powder (Bad.)	"			
	"	Ponceau 2 R (Weiler)	"			
	"	Lithol-red R in pulp (Bad.)	No effect.			
	"	"	Autol-red RLP in pulp (Bad.)	"		

Group.	Caustic Soda 40° B.		Coal-tar Colouring Matter.	Caustic Soda 12° B.			
	Colour of the Lake.	Supernatant Liquid.		Colour.	Supernatant Liquid.		
Red lakes	No change	Colourless	Autol-red RLP bluish in pulp (Bad.)	No effect.			
		"	Pigment-Bordeaux R, N in pulp (M. L. Br.)	"			
		"	Pigment - purple A in pulp (M. L. Br.)	"			
		"	Helio fast red G in pulp (Bayer)	"			
		"	Permanent red 6 B in pulp (Berl.)	No change	"	Pale golden-yellow.	
	At first no change, later brown	"	Brilliant red B for lakes in pulp (M. L. Br.)	"	"	Pale reddish.	
		Deep red to blue-violet	All yellowish, reddish, and bluish brands of eosine from all makers	Decomposed	"	Bluish carmine ; by reflected light, green fluorescence.	
		From fiery carmine slowly changes to bluish Bordeaux-red	Pale bluish with dark green fluorescence	All yellowish, reddish, and bluish brands of erythrosine from all makers	"	"	Ruby-red with green fluorescence.
		Dark reddish blue (after long standing)	Pure blue-violet without fluorescence	All yellowish, reddish, and bluish brands of phloxine from all makers	"	"	Very bluish red ; by reflected light, black with slight green fluorescence.
		Dark red-violet	Colourless	All yellowish, reddish, and bluish brands of rose Bengale from all makers	"	"	Deep bluish red ; no fluorescence.
Bright red-violet	"	Rhodamine, all brands	Unchanged	"	Pale bluish brown		
Deep yellowish to reddish brown	Chestnut brown (clear)	All brands of safranine, magenta, rubin, tannin-heliotrope, and rhoduline precipitated with tannin and antimony salt	Brighter and browner	"	Bright brownish to dark brown, clear.		
No change	Colourless	All brands of safranine, magenta, and rubin on white China-clay	After being shaken, slowly discoloured to bluish or brownish pink	"	Bright yellowish to reddish brown, clear.		
"	"	All brands of safranine, magenta, and rubin on green-earth. Idem: tannin-heliotrope (Cass.) and rhodulin brands (Bayer) on green-earth or China-clay	No change	"	Colourless.		
4. Violet lakes	Chestnut-brown to black	Colourless to bright red-brown	All brands of methyl- and methylene-violet from all makers, rhodulin-heliotrope (Bayer), precipitated with tannin and antimony salt	Dirty violet, reddish brown to black	Yellowish to reddish brown.		

Group.	Caustic Soda 40° B.		Coal-tar Colouring Matter.	Caustic Soda 12° B.	
	Colour of the Lake.	Supernatant Liquid.		Colour.	Supernatant Liquid.
Violet lakes	No change	Colourless	The same colouring matters on white China-clay or green-earth	No change	Colourless.
	"	"	Methyl-violet BB (M. L. Br.) on China-clay	Decolorised	Bluish violet.
	Chestnut-brown	"	Cresyl fast violet 2 B (Mühl.), on China - clay or green-earth	"	Colourless.
	After a long time, dirty reddish violet	"	Formyl-violet S 4 B (Cass.) Acid-violet 6 BN (Bad.) Guinea-violet 4 B (Berl.)	Somewhat brighter	Colourless.
	Carmoisin-red	Pale pink	Fast acid-violet A 2 R (M. L. Br.)	Decomposed.	
		Colourless	Fast acid-violet RO (M. L. Br.)	Red-violet Bluish pink-red Much brighter	Red-violet
		Red-violet	Fast acid-violet B (M. L. Br.) Acid-violet 4 R (Bad.)		Red-violet
		"	Acid-violet 4 R (Bad.)	Ruby-red.	Colourless.
	Decolorised after 10 hours	Pale pink	Acid-violet 3 RA (M. L. Br.)	Dull bluish pink	Pale pink.
	Carmine	Colourless	Violet R for lakes (Berl.)	Dull violet	Ruby-red.
Bordeaux-red	"	Helio-violet RL (Bayer)	No remarkable effect.		
Reddish brown	"	Benzo fast violet R (Bayer)			
5. Blue lakes	Colcothar-like coloured	"	All brands of alkali blue from all makers, also blue BSHL (Oeh.)	Dark red-brown	Colourless.
	Decolorised	"	Blue for lakes CB (Cass.)	Pale greenish blue	Pale pink.
		Pink-red (nearly colourless)	Neptune-blue B (Bad.)	No change	"
		"	Wool-blue BB, 5 B, R (Berl.)	Greenish-reddish blue	Colourless.
	Reddish brown (chocolate-brown)	Brownish red	Cotton-blue O (M. L. Br.)	Brownish red	"
		Colourless	Benzo fast blue 5 R (Bayer)	"	"
		Pale bluish pink	Opal-blue, all brands (M. L. Br.)	"	Carmoisin-red
		Yellowish pink	Water-blue 5 R (W. t. M.) Pure blue O (M. L. Br.)	Red-violet Brick-red	Colourless.
		Colourless	Water-blue R (M. L. Br.) Blue for lakes R (M. L. Br.)	Dark brown	Pale pink.
	Brown-red	"	Helio-azurin RL (Bayer)	"	"
	Lively carmine		Bluish-red	Rubin-red.	
Dark red-violet	Red-violet	Dianil-blue G, B (M. L. Br.)	Violet	Violet.	
	Pale bluish	Helio fast blue BL (Bayer)	Completely decomposed.	Colourless.	
	"	Helio fast blue SL (Bayer)	Dark red-violet		
	Colourless	Helio-azurin BL (Bayer)	Bluish red	Pale pink.	
	"	Benzo-azurin G (Bayer)	Completely decomposed.		
	"	Wool-blue N (Bayer)			
Bright red-violet	"	Patent blue A (M. L. Br.)	Somewhat brighter	Red-violet.	

Group.	Caustic Soda 40° B.		Coal-tar Colouring Matter.	Caustic Soda 12° B.		
	Shade of the Lake.	Supernatant Liquid.		Shade.	Supernatant Liquid.	
Blue lakes	Bright greenish blue	Colourless	Patent blue L (Bayer)	Greenish blue	Bluish violet.	
		Reddish brown	New patent blue GA (Bayer)	"	"	
	Bluish carmoisin-red	Pale pink	Brilliant azurin B (Bayer)	decomposed.		
		Colourless	Cotton-blue OO (Oehler)	Dark purple	Colourless.	
	Purple-red Completely decomposed	Black-blue	Brilliant azurin 5 G (Bayer)	Completely decomposed.		
		"	Benzo chrome-black-blue B (Bayer)	"	"	
	No remarkable effect	Bluish violet	Brilliant benzo-blue 6 B (Bayer)	"	"	
		"	Benzo pure blue (Bayer)	"	"	
		"	Benzo fast blue BN (Bayer)	"	"	
	Red-brown	Reddish brown	<i>Precipitated by tannin and antimony salt.</i>			
			Victoria-blue B (Bad.)	Red-brown	Pale yellowish.	
			Victoria pure blue (Bad.)	Brick-red	Reddish brown.	
		"	New methylene-blue GG (Cass.)	Dark brown	Pale brownish.	
		Brownish red	New methylene-blue F, FR (Bayer)	Red-violet	Reddish brown.	
			"	Methylene-blue R (M. L. Br.)	Grey, nearly black	"
Colcothar-coloured		Reddish brown	Turquoise-blue BB (Bayer)	Completely decomposed.		
		Yellowish brown	Turquoise-blue G (Bayer)	Pale red-violet	Reddish brown.	
Dark green to blackish green		Colourless	<i>On white China-clay.</i>			
			Victoria-blue B (Bad.)	"	Colourless.	
	"	New methylene-blue F, FR (Bayer)	Reddish brown	"		
	Pale brown-red	<i>Precipitated by tannin and antimony salt.</i>				
		Red-brown	Methylene-blue BG (Bad.)	Completely decomposed.		
	Red-brown	Methylene-blue B (Bad.)	"	"	"	
		<i>On white China-clay.</i>				
Colourless		Methylene-blue BB (M. L. Br.)	Red-violet	Colourless.		
"		Methylene-blue B, BG, BH (Bad.)	"	Faintly reddish.		
"		Turquoise-blue BB (Bayer)	Decolorised	Colourless.		
" " " " "	"	New methylene-blue BB (Bayer)	Red-violet	Faintly reddish.		
	<i>On green-earth.</i>					
	"	Capri-blue GN (Mühl.)	Blackish violet	Colourless.		
"	"	Turquoise-blue G, BB (Bayer)	Dark green	"		

Group.	Caustic Soda 40° B.		Coal-tar Colouring Matter.	Caustic Soda 12° B.		
	Shade of the Lake.	Supernatant Liquid.		Shade.	Supernatant Liquid.	
Blue lakes	Red-violet to blackish violet	Colourless	<i>On white China-clay.</i> Victoria pure blue (Bad.)	Pale red-violet	Colourless.	
		"	Capri-blue GN (Mühl.)	Red-violet	"	
		"	Methylene-blue R (M. L. Br.)	"	"	
		"	Methylene-blue BH (Bad.)	"	Faintly reddish.	
	Brown-red	Yellowish brown	"	Methylene-blue GG (Cass.)	"	Colourless.
			"	<i>On green-earth.</i> Methylene - blue BB, R (M. L. Br.)	"	"
			"	Methylene-blue GG (Bad.)	"	Faintly reddish.
			"	Methylene-blue B (Bad.)	"	Colourless.
	Blue-black	Colourless	"	New methylene-blue F, FR (Bayer)	Reddish blue	"
			"	Turquoise-blue G on China-clay (Mühl.)	Dark green	"
			"	<i>On green-earth.</i> Victoria-blue B (Bad.)	Blue-black	Colourless.
			"	Victoria pure blue (Bad.)	No change	"
	Brown-black	Brown-red	"	Methylene-blue GG (Cass.)	Blackish green	"
			"	Fast navy-blue R (Oeh.)	Completely decomposed.	
			"	<i>Precipitated by tannin and antimony salt.</i> Fast-navy-blue R (Oeh.)	Completely decomposed.	
"			<i>Precipitated by tannin and antimony salt.</i> Capri-blue GN (Mühl.)	Reddishgrey	Pale yellowish brown.	
Decolorised	Pale brown-red	"	Methylene-blue BB (M. L. Br.)	"	"	
	Colourless	"	Fast navy-blue R (Oeh.) on China-clay	Completely decomposed.		
	"	"	<i>Precipitated by tannin and antimony salt.</i> Navy-blue BN (Bad.)	Bluish grey	Pale yellowish.	
	Completely decomposed	"	Methylene-blue BH (Bad.)	Completely decomposed.		
6. Green lakes	Bluish grey to greenish grey	Colourless	Methylene-blue BB (Bayer)	Redder	"	
		"	New methylene - blue BB (Bayer) on green-earth	"	Colourless.	
		"	Acid-green extra conc. (Cass.)	Becomes brighter	"	
		"	Green for lakes BW (Cass.)	"	"	
6. Green lakes	Colourless	"	Acid-green D conc. (M. L. Br.)	"	"	
		"	Blue-green S (Bad.)	"	Pale yellowish.	
		"		"	Pale pink.	

Group.	Caustic Soda 40° B.		Coal-tar Colouring Matter.	Caustic Soda 12° B.		
	Shade of the Lake.	Supernatant Liquid.		Shade.	Supernatant Liquid.	
Green lakes	Bluish grey to greenish grey	Colourless	<i>Precipitated by tannin and antimony salt.</i> Light-green SF, SL (Bad.)	Becomes brighter	Colourless.	
		„	Neptune - green, all brands (Bad.)	Decolorised	Pale yellow to colourless.	
	Completely decomposed Red-violet	„	Guinea-green, all brands (Berl.)	„	„	
		Emerald-green	Acid-green (Bayer)	„	Colourless.	
	Black-green	„	Naphthol-green B (Bayer)	Decomposed	Emerald-green. Violet.	
		Red-violet	Colourless	Fast green, bluish (Bayer)	Dark greenish blue	Pale bluish red.
	Blue-black	Red-violet	Benzo-green G	Only small effect	Greenish black		Colourless.
		Colourless	Benzo dark green GG (Bayer)			
	Decolorised	Brownish red		<i>Precipitated by tannin and antimony salt.</i> Brilliant green	Decolorised	Pale reddish brown.
			Malachite-green			
		Colourless	Malachite-green on China-clay	No change	Colourless.	
			Brilliant green on China-clay	„	„	
Brilliant green on green-earth			„	„		
No effect	„	Malachite-green on green-earth	„	„		

Table XII. is of the highest importance inasmuch as by some practice probably most of the colouring matters can be identified by its means without the reaction with caustic soda. Hence all the reactions related to it have been represented in the most comprehensive and handiest way possible. This will enable the analyst to check the identifications made by means of its reaction by those obtained with the other reagents. This is especially the case with regard to the ether zone test, which is generally carried out at the same time. Although this test, according to experience, has not the importance generally attached to it, it is a useful control, especially when there is a doubt as to the nature of the colouring matter. The slight differences of the shade produced by sulphuric acid, as, for instance, the pure red or yellow shades of crimson, can only be detected by the trained and experienced eye of the colour analyst.

Table XIII., which shows the effects of caustic soda of 12° and 40° strength, is really a means of checking the determination; but inasmuch as weak caustic soda does not always effect the change speedily, and is often very slow in action. It is the principal reason why this reaction is not always a quite sure one. If, however, the sample gives distinct results with strong and weak caustic soda, there is then no difficulty in arriving at a reliable decision.

There are such cases, and the table shows a certain number of colouring matters which can be thus differentiated.

The practical use of Tables I.-XIII. can best be explained by an example of an analysis drawn from the author's own practice. A wall-paper lake of sky-blue tint and known as azure-blue had to be analysed. Its pure blue shade at once excluded its being due to any mixture of green and blue coal-tar colours, as such would have given a duller and much greener shade. It was therefore only necessary to test for blue colouring matters.

On testing with hot water, alcohol, and acetic acid, after some time it was found that traces only of the colouring matter were dissolved by the first two solvents, while acetic acid dissolved a fair quantity of it. The colouring matter, therefore, belonged to Class VII. This shows that the precipitations from Neptune-blue B, Neptune-green S, SB (all from the Badische works), New patent blue GA (Bayer), and Blue for lakes CB (Cassella) answer to the above reactions. If there is any doubt as to the strength, it might be Patent blue A (Höchst) or Neptune-green SBN (Badische), which both belong to Class V.; or if the operator lacks skill and experience, it may be Patent blue L (Höchst) or Neptune-green SG, which are assigned to Class I.

On treating the lake with strong sulphuric acid it was at once decolorised (grey remainder) and the ether zone was colourless.

According to Table XII., this indicates Neptune-blue B, New patent blue GA, Patent blue A and L (even if Classes V. and I. are taken into consideration), because

Blue for lakes CB	becomes greenish yellow with sulphuric acid		
Neptune green S, SBN	„ brownish yellow	„	„
„ „ SG	„ brownish orange	„	„
„ „ SB	„ yellowish green	„	„

This reduces the choice of coal-tar colours from nine to four. On treating the lake with the 40° caustic soda it was decolorised after a time, and the supernatant liquid was coloured pale pink. Table XIII. indicates it as Neptune-blue B, since New patent blue GA gives a bright greenish blue residue and a reddish brown liquid; Patent blue L forms a bright greenish blue residue and a colourless liquid, and Patent blue A a bright reddish violet residue and a colourless liquid with this caustic soda. Tests with Neptune-blue B produced really the same shade on the lake in question, so that it was easily matched after an analysis of the carrier.

This simple analysis suffices for the colouring matter in most of the less complicated aniline lakes, even if they belong to a class represented by a large number of types, as, for instance, the group containing the red azo colours. The analysis becomes, however, much more difficult if the lake in question is a combined one. In this case comparative trials must be made with the lake of a known colouring matter* in order that the reactions may indicate the kind

* See Zerr and Rübencamp, *Treatise on Colour Manufacture*, Eng. ed., p. 540.

of colouring matter present. As a complicated lake generally contains colouring matters of various degrees of solubility, the test for solubility should first be used. A lake containing, for instance, one colouring matter of Class III. and one of Class V. will give solubility tests belonging to Class I.

As a complete series of *standard lakes* is very important for the analysis of the lake pigments as well as for the study of their reactions, the author gives the directions, based on his long practice, for their preparation, stocking, and use.

As already explained, the reagents used always produce some change in the shade of the lake, and therefore such changes are best seen by using white carriers for standard lakes in order to avoid as much as possible the disturbing effects of the carrier. Therefore barytes, artificial barytes, sometimes white China-clay, and for special cases green-earth are allowed. The last two mentioned are important for a few of the basic coal-tar colours only, and these are rarely analysed except for studying their reactions. Their manufacture and preparation are, however, required for comparing the intensity of certain special lakes, *e.g.* certain lime colours.

The precipitation of the acid coal-tar colours with barium chloride alone or in conjunction with soda and sulphate of alumina are, however, always best performed with barytes only: a remark equally applicable to the precipitations of basic coal-tar colours with tannin and antimony salt.* If for the precipitation of acid coal-tar colours aluminium sulphate and soda are necessary, only a sufficient quantity of these should be used so as to avoid the weakening effect. This also applies to standard lakes precipitated by aid of sugar of lead, lead nitrate, and other materials likely to lessen the brightness of the shade.

My experience is that the 5 per cent. precipitates are the most suitable both with acid and basic coal-tar colour lakes for preliminary trials, intensity tests, and checking, especially with the tin salt solution; it being, however, understood that the intensity tests require some practice. In the case of the insoluble azo colours (pigment-red (Höchst), lithol-red (Badische), etc.) the precipitates should have a strength of 20 to 30 per cent., so as to allow of the intensity tests being made quickly and conveniently.

Standard lakes should be kept in stock in quantities of not more than 100 to 150 grammes, because the analyst should accustom himself to use small weights. This has been found to be a chief condition in readily testing for the colouring matter of aniline lakes. The work of the analyst is rendered easier in proportion to the fulness of the series of standard lakes, but the greater is the trouble in storing them so as to be ready for use. The types should be numbered according to their alphabetical sequence, and, for more readily finding any particular type, a special book should be kept wherein is recorded all observations made in practice. The following is an example:—

* For lactates of antimony, see Zerr and Rübencamp, *l.c.*, p. 290.—[TRANSLATOR.]

	Standard Type.	
Alkali-blue 5 B (Oehler)	No. 1	Easily soluble, fast to water, etc.
Eosine A 2 GL (Höchst)	„ 104	Very suitable for yellowish geranium lakes or mixtures with azo colouring matters, etc.
Red for lakes P in pulp (Höchst) etc. etc.	„ 227	Darkens considerably at the higher temperatures; not suitable for spirit-varnish paints.

The standard types are best kept in small bags of strong, smooth paper, arranged in the order of their numbers in drawers divided into compartments by wooden partitions so as to be readily accessible. All standard lakes must be finely powdered and sifted if necessary.

The reactions with sulphuric acid, especially those yielded by the combined lakes, often give shades which the inexperienced analyst is liable to mistake for those yielded by a single colouring matter. For instance, an azo colouring matter may give a carmine colour with sulphuric acid similar to that produced by the lake under analysis, while eosine precipitates are rendered yellow, like some brands of orange belonging to the group of azo colouring matters. Generally the shade of the lake being analysed is such as to indicate to the experienced colourman the presence of a combination of colours, and from his knowledge of the coal-tar colours used for lakes he is able to conduct his inquiry successfully. The following operations are mainly based on a careful consideration of all the observations made by analysts. They will enable the analyst to check the accuracy of his conclusions by comparing these with the action of standard samples, and their behaviour with the tin-chloride-hydrochloric-acid solution given in Table XV.

By the reducing action of the solution just mentioned most of the coal-tar colours used for lake-making are completely decolorised after a definite time if the carriers are white; some are only partially decolorised, while a few are only slightly changed. The decolorisation may occur in a few minutes or require six months or more, it being assumed that the same quantities of lake are treated with a uniform quantity of the same solution. The value of the tin-salt reaction can be readily seen by consulting Part I. of this treatise. This will enable the reader to appreciate the practical advantages of the following table.

An example given later on will exemplify the diagnostic value of the tin salt solution for the determination of the colouring matters of a combined lake.

Here it may be mentioned that the rare instances given in which the decolorisation occupies months are generally of no practical use for analysis; but occasionally every colour-works may require even a longer time for imitating certain aniline lakes. The time required for decolorisation in such cases is simply for the reader's information.

TABLE XIV.
REACTIONS OF THE COAL-TAR COLOUR LAKES WITH A
TIN SALT SOLUTION.

Decolorised in	Remainder.	Supernatant Liquid.	Colouring Matter.	Precipitating Agent or Carrier.
5-10 mins.	White	Colourless, clear	Mordant-yellow R (Bad.)	Barium chloride.
	"	Very pale bluish, turbid	Brilliant benzo-blue 6 B (Bayer)	"
20 mins.	Pale pink	Colourless, clear	Chrysophenin G (Bayer)	"
	Reddish white	" "	Cloth-yellow G (Oeh.)	"
	Yellowish white	" "	Cloth-red R (Oeh.)	"
30 mins.	White	" turbid	Helio-purpurin 5 BL (Bayer)	"
	"	" "	Helio-purpurin 3 BL (Bayer)	"
	"	" "	Brilliant crocein 3 B (Bayer)	"
	"	" "	Brilliant crocein 3 B conc. 20712 (Bayer)	"
40 mins.	"	" "	Orange II. L (M. L. Br.)	"
45 mins.	Reddish white	" clear	Brilliant crocein M ₀₀ (Cass.)	"
			Pyramine-yellow G for lakes (Bad.)	"
1 hour	White	" turbid	Benzo-purpurin 4 B (Bayer)	"
	"	" clear	Mordant-yellow G (Bad.)	"
	Pale pink, nearly white	" "	Paper-yellow A (Bad.)	"
	Pale yellowish grey	" "	Paper-yellow 3 G (Bad.)	"
	White	Greenish, clear	Metanil-yellow PL	"
	"	Pale yellowish	Pigment-chlorine GG in pulp (M. L. Br.)	...
	"	Colourless, turbid	Orange II. 35462 (Weiler)	Barium chloride.
	"	" "	Orange II. (Cass.)	"
1½ hours	"	" "	Brilliant crocein B ₀₀ (Cass.)	"
	"	" "	Orange extra	"
	"	" "	Orange II. B (Bayer)	"
	"	" "	Orange II. extra conc. 52 SE (Weiler)	"
2 hours	"	" clear	Fast light yellow G (Bayer)	"
	"	" turbid	Orange ENL (Cass.)	"
	"	" "	Orange II. (Bad.)	"
	"	" "	Orange G extra (Leipzig)	"
	"	" "	Orange A (Mühl.)	"
	"	" "	Fast orange O (M. L. Br.)	"
	"	Sulphur-yellow, turbid		
2½ hours	"	Colourless, turbid	Brilliant azurin 5 G (Bayer)	"
3 hours	"	" "	Victoria-yellow conc. (M. L. Br.)	"
	"	" "	Sulfon-yellow R (Bayer)	"
	"	Golden-yellow turbid	Helio fast blue BL (Bayer)	"
5 hours	"	Colourless, turbid	Mandarin G extra (Berl.)	"
	"	Pale yellowish, clear	Naphthol-yellow S, all makers	"
	"	Colourless, turbid	Auramine O	China-clay.
	"		Xylidin-ponceau R (Leipzig)	Barium chloride.

Decolourised in	Remainder.	Supernatant Liquid.	Colouring Matter.	Precipitating Agent or Carrier.
5 hours	White Bluish white	Pale red-violet Colourless, turbid	Benzo-azurin G (Bayer) Capri-blue GN (Mühl.)	Barium chloride. Tannin.
	White	" "	"	China-clay.
	Greenish grey	" "	"	Green-earth.
6 hours	White	" "	Ponceau 4 BGL (Berl.)	Barium chloride.
	"	Yellowish green	Cresyl fast violet 2 B (Mühl.)	Tannin.
	"	Colourless, clear	"	China-clay.
	Greenish grey	" turbid	"	Green-earth.
	Reddish grey	Pale reddish	Benzo-chrome-black-blue B (Bayer)	Barium chloride.
6½ hours	White	Colourless, turbid	Ponceau for lakes R (Cass.)	"
7 hours	"	" "	Excelsior ponceau for lakes JJN (Cass.)	"
	"	" "	Ponceau for lakes LN (Bad.)	"
	"	" "	Ponceau 3 RB (Berl.)	"
7½ hours	"	" "	Vermilion-scarlet G (Leipzig)	"
8 hours	"	" "	Brilliant crocein B (Cass.)	"
8½ hours	"	" "	Ponceau for lakes GG	"
9 hours	"	" clear	Chloramine-yellow GG (Bayer)	"
	"	" turbid	Ponceau for lakes LGN (Bad.)	"
	"	" "	Brilliant ponceau G (Cass.)	"
10 hours	Reddish white	" "	Brilliant double scarlet 3 R (Bayer)	"
	White	" "	Orange RL (Leipzig)	"
	"	" "	Brilliant crocein 5 B (M. L. Br.)	"
12 hours	"	" "	Brilliant crocein, yellowish (M. L. Br.)	"
13 hours	"	" "	Ponceau B extra	"
14 hours	Bluish white	" "	Methylene-blue BB	Tannin.
18 hours	Bluish grey	" "	"	China-clay.
19 hours	White	" "	Orange 2 R (M. L. Br.)	Barium chloride.
20 hours	Greenish grey	" "	Methylene-blue R (M. L. Br.)	Tannin.
	White, greenish	" "	"	China-clay.
	Greenish grey	" "	"	Green-earth.
	Dirty bluish grey	" "	Methylene-blue BB (M. L. Br.)	Green-earth.
	White	" "	Benzo-green G (Bayer)	Barium chloride.
22 hours	"	" "	Ponceau for lakes LE (Bad.)	"
	"	" "	Ponceau 2 R (Weiler)	"
25 hours	"	" "	Brilliant orange G (M. L. Br.)	"
26 hours	Reddish white	" "	Ponceau RL (Berl.)	"
27 hours	White	" "	Excelsior ponceau for lakes JN (Cass.)	"
28 hours	"	" "	Orange for lakes ON (Bad.)	"
29 hours	Bluish white	" "	Methylene-blue BG	China-clay.
30 hours	Blue-green	Grass-green, clear	Methyl-violet R, RR, BB (M.L.Br.)	Tannin.
	Reddish grey	Nearly colourless, turbid	"	China-clay.
	Black	Colourless, turbid	"	Green-earth.
	Greenish white	" "	Methylene-blue BH (Bad.)	China-clay.
	White	" "	Methylene-blue B (Bad.)	"
	White	" "	"	"
	Greenish grey	" "	"	Green-earth.
	Bright greenish grey	" "	New methylene-blue FR (Bayer)	China-clay.

Decolorised in	Remainder.	Supernatant Liquid.	Colouring Matter.	Precipitating Agent or Carrier.
30 hours	White	Golden-yellow, turbid	Citronin G ₀₀₀ (Mühl.)	Barium chloride
	Bluish grey	Colourless, clear	Metanil-yellow 26060 (Weiler)	"
	White	Pale yellowish	Metanil - yellow extra conc. (Weiler)	"
	"	Colourless, turbid	Metanil-yellow, extra (Berl.)	"
32 hours	"	" "	Ponceau 2 RX (Leipzig)	"
35 hours	Greenish grey	" "	Methylene-blue BH (Bad.)	Green-earth.
	"	" "	Methylene-blue BG (Bad.)	"
40 hours	Pale flesh-coloured	" "	Manchester-brown EE (Cass.)	China-clay.
	Pale bluish pink	Colourless	Chrysoidin O	"
	Yellowish white	"	Vesuvium 4 GB (M. L. Br.)	"
	"	"	Vesuvium BL (Bad.)	"
41 hours	Ochreish	"	Chloramine-orange G (Bayer)	Barium chloride.
52 hours	Yellowish white	Pale pink, turbid	Methylene-violet RRA (M. L. Br.)	China-clay.
	Greenish grey	Pale reddish, "	"	Green-earth.
	Yellowish white	Colourless, "	Methylene - violet BN powder (M. L. Br.)	China-clay.
	Greenish grey	" "	Methylene - violet BN powder (M. L. Br.)	Green-earth.
55 hours	White	" "	Mandarin RL (Berl.)	Barium chloride.
56 hours	"	" "	Bordeaux O (M. L. Br.)	"
60 hours	Straw-yellow, nearly white	Slightly yellowish	Paper-yellow R (Bayer)	"
	Dull flesh-coloured	Colourless, clear	Direct yellow R (Bayer)	"
	Reddish white	" turbid	Brilliant crocein M (Cass.)	"
	White	Pale bluish violet	Formyl-violet S 4 B (Cass.)	"
	Bluish grey	Colourless, dull	Benzo fast blue BN (Bayer)	"
	Reddish white	" "	Benzo dark green GG (Bayer)	"
	Greenish grey	" "	New methylene-blue FR (Bayer)	Green-earth.
	Dark reddish grey	" "	Fast navy-blue R (Oeh.)	"
65 hours	Flesh-coloured	" "	Pluto-orange G (Bayer)	Barium chloride.
	Pale pink	Pale pink, turbid	Helio-violet RL (Bayer)	"
	White	Pale bluish violet	Guinea-violet 4 B (Berl.)	"
66 hours	"	Pale bluish violet	Acid-violet 6 BN (Bad.)	"
74 hours	Reddish white	Colourless, turbid	Fast-red E conc. 130 (Leipzig)	"
	Reddish grey	" "	Bordeaux G double conc. (Leipzig)	"
75 hours	White	Pale red-violet	Acid-violet N (M. L. Br.)	"
	Reddish white	Colourless, turbid	Brilliant crocein R (M. L. Br.)	"
	"	" "	Brilliant crocein BB (M. L. Br.)	"
	Pale pink, nearly white	Pale yellowish pink, turbid	Violet for lakes R (Berl.)	"
	Reddish white	Colourless, turbid	Brilliant crocein B (M. L. Br.)	"
	White	" clear	Lithol-red R in pulp (Bad.)	"
80-85 hours	Pale violet, nearly white	" turbid	Bordeaux G, R (M. L. Br.)	"
90 hours	Reddish white	" "	Ponceau GR (Weiler)	"
	Very bright pink	" "	Fast-red BT (Bayer)	"
	Reddish white	" "	Helio-purpurin 10 BL (Bayer)	"
	Pale bluish green	Grass-green, "	Methyl-violet B extra (Bad.)	Tannin.

Decolorised in	Remainder.	Supernatant Liquid.	Colouring Matter.	Precipitating Agent or Carrier.
1 day (24 hours)	White	Colourless, turbid	Palatine-ponceau for lakes GG (Bad.)	Barium chloride.
	"	Very pale yellowish, clear	Scarlet for lakes in pulp (M. L. Br.)	"
	Grey-violet	Dark brown-red	Azo-carmine B in powder (Bad.)	"
	Greenish grey	Pale greenish yellow	New methylene-blue GG (Cass.)	China-clay.
	Dirty green	Pale yellowish green	"	Green-earth.
	White	Colourless, turbid	Methylene-blue BH (Bad.)	Tannin.
	"	" "	Methylene-blue BG (Bad.)	"
	"	" "	Methylene-blue B (Bad.)	"
	"	" "	New methylene-blue FR (Bayer)	"
	Bright reddish brown	Ochre-like, "	Russia-leather-red N (Oeh.)	"
	White	Pale brownish violet, turbid	Brilliant azurin B (Bayer)	Barium chloride.
	Red-brown	Brownish red, turbid	Rhodulin-red C (Bayer)	China-clay.
	Blue-black	Very bright reddish violet, turbid	"	Green-earth.
	White	Pale reddish, "	Benzo fast violet R (Bayer)	Barium chloride.
	"	Colourless, clear	Benzo-Bordeaux 6 B (Bayer)	"
	Deep red-violet	Reddish, turbid	Tannin-heliotrope (Cass.)	Tannin.
	Red-violet	Yellowish red, turbid	"	China-clay.
	Blue-black	Colourless, turbid	"	Green-earth.
	Dirty red-violet	Red-violet, "	Brilliant rhodulin-red B (Bayer)	Tannin.
	Dirty reddish grey	Colourless, "	"	China-clay.
	Nearly blue-black	" "	"	Green-earth.
1½ days (36 hours)	Pale yellowish, nearly white	" clear	Bismarck-brown F (Bayer)	China-clay.
	Yellowish white	" turbid	Fast navy-blue R (Oeh.)	Tannin.
	"	Faintly yellowish	Paper-yellow GG (Bayer)	Barium chloride.
	White	Sulphur-yellow	Citronin A, G (Mühl.)	"
	Brownish white	Colourless, clear	Fast ponceau B (Bad.)	"
	Reddish grey	Brownish yellow, turbid	Helio fast blue SL (Bayer)	"
	Blue-green	Bright green, clear	Wool-blue N	"
	Dark red-violet	Pale carmoisin, turbid	Safranine M _{ooo} (Oeh.)	Tannin.
	Pale brownish red	Pale pink, turbid	"	China-clay.
	Blue-black	Colourless, "	"	Green-earth.
	Chocolate-brown	Pale greenish, turbid	New magenta O (M. L. Br.)	Tannin.
	Dirty red-violet	Bright brownish red, turbid	Magenta in powder AB (Bad.)	China-clay.
	Very dark red-violet	Colourless, turbid	Magenta in powder, dark (Bad.)	Green-earth.
	Brownish red	Ochreish, "	Russia-leather-red N (Oeh.)	China-clay.
	Bright brownish red	Pale ochreish, "	"	Green-earth.

Decolorised in	Remainder.	Supernatant Liquid.	Colouring Matter.	Precipitating Agent or Carrier.
3 days (72 hours)	White	Colourless, turbid	Palatine-ponceau for lakes G (Bad.)	Barium chloride.
	Pale yellowish	Pale brownish yellow, clear	Indian-yellow R (Bayer)	"
	Pale pink	Colourless, clear	Mikado-orange 4 R (Mühl.)	"
	White	" "	Mikado-orange 3 RO (Mühl.)	"
	"	" turbid	Ponceau 44099 (Berl.)	"
	Pale pink	Dirty red-violet, turbid	Helio-azurin RL (Bayer)	"
	Dirty bluish violet	Slightly red-violet, turbid	Helio-azurin BL (Bayer)	"
	Pale pink	Dirty red-violet, turbid	Benzo fast blue 5 R (Bayer)	"
	Dirty grey-green	Pale greenish yellow, turbid	Methyl-violet B extra (Bad.)	China-clay.
	Bluish grey	Colourless, turbid	Methyl-violet B extra (M. L. Br.)	Green-earth.
	Dirty red-violet	" "	Methylene-violet RRA (M. L. Br.)	Tannin.
	Dirty blue-grey	" "	Methylene-violet BN in powder (M. L. Br.)	"
	Bright greenish grey	" clear	Navy-blue BN (Bad.)	China-clay.
	Dirty dark green	" "	"	Green-earth.
	Bright reddish-brown	" "	Chloramine-yellow N (Bayer)	Barium chloride.
4 days	White	" turbid	Brilliant orange R (M. L. Br.)	"
	"	" "	Brilliant red for lakes G (Bad.)	"
	Pale flesh-coloured	" "	Ponceau BN (Bad.)	"
	White	" "	Ponceau 3 RL (Berl.)	"
	Reddish white	" "	Ponceau RL (Berl.)	"
	White	" "	Benzo fast scarlet 4 BS (Bayer)	"
	"	" "	Benzo fast scarlet 5 BS (Bayer)	"
	Dirty greenish grey	Pale greenish yellow	Turquoise-blue BB (Bayer)	China-clay.
	Greenish grey	Colourless, turbid	New methylene-blue F (Bayer)	Tannin.
	White	" "	"	China-clay.
4½ days	Greenish grey	" "	New methylene-blue BB (Bayer)	Tannin.
	"	" "	Brilliant green, all makers	Green-earth.
	"	" "	"	Tannin.
	White	" "	"	China-clay.
	Reddish white	" "	Ponceau 3 R (Weiler)	Barium chloride.
	Pale pink, nearly white	Bright red-violet, turbid	Acid-violet 3 RA (M. L. Br.)	"
	5 days	Reddish white	Colourless, turbid	Ponceau GL (Berl.)
"		" "	Ponceau 58940 (Berl.)	"
"		" "	Ponceau BO extra (Berl.)	"
White		" "	Ponceau 64580 (Berl.)	"
"		" "	Ponceau for lakes 2 RZ (Bad.)	"
"		" "	Ponceau 3 RL (M. L. Br.)	"
"		" clear	Brilliant scarlet for lakes in pulp (M. L. Br.)	"
"		" "	Azo-phloxine 2 G (Bayer)	"
Reddish white		" "	Guinea-red 4 R (Berl.)	"
"		" "	Brilliant acid-carmine G, 6 B (Oeh.)	"

Decolorised in	Remainder.	Supernatant Liquid.	Colouring Matter.	Precipitating Agent or Carrier.
5 days	Flesh-coloured	Colourless, clear	Columbia fast scarlet 4 B (Berl.)	Barium chloride.
	Greenish grey	" turbid	New methylene-blue F (Bayer)	Green-earth.
5½ days	White	Pale pink	Orange A extra (Bad.)	Barium chloride.
6 days	Flesh-coloured	Colourless, clear	Scarlet GRL (M. L. Br.)	"
	Pale pink	" turbid	Brilliant acid carmine B (Oeh.)	"
	Reddish white	" turbid	Ponceau 6 RB (Berl.)	"
	White	"	Helio fast red in pulp (Bayer)	"
	"	Greenish blue, turbid	Patent blue A, L (M. L. Br.)	"
	"	Colourless, turbid	Naphthol-green (M. L. Br.)	"
	Red-violet	Very bluish pink, turbid	Safranin BS, S 150 (Cass.)	Tannin.
	Pale brownish pink	Pale bluish pink, turbid	"	China-clay.
	Blue-black	Colourless, turbid	"	Green-earth.
	Dirty red-violet	Pale red-violet	Rhodulin-violet (Bayer)	China-clay.
	Dark reddish grey	Colourless, turbid	"	Green-earth.
	Red-violet	Pale brownish pink, turbid	Rhodulin-heliotrope (Bayer)	China-clay.
	Dark red-violet	Colourless, turbid	"	Green-earth.
	Dirty grey-green	Pale greenish yellow, turbid	Turquoise-blue BB (Bayer)	Tannin.
	"	Colourless, turbid	Turquoise-blue BB (Bayer)	Green-earth.
	Bluish grey	" "	New methylene-blue BB (Bayer)	China-clay.
	Greenish grey	" "	Brilliant green, all makers	Green-earth.
6½ days	Bright	" clear	Cloth-red O (M. L. Br.)	Barium chloride.
	reddish grey	"	"	"
7 days	Yellowish white	" turbid	Ponceau R for lakes (Bad.)	"
	Reddish white	" "	Ponceau RR for lakes (Bad.)	"
	White	" "	Ponceau GRLH (M. L. Br.)	"
	"	" "	Brilliant carmine L (Bad.)	"
	"	" "	Fast red AV (Bad.)	"
	"	" clear	Crocein-scarlet 10 B (Bayer)	"
8 days	Pale bluish pink	" turbid	Fast red BN (Bad.)	"
	Pale pink	" "	Ponceau GRL (M. L. Br.)	"
	White	" "	Ponceau RL (M. L. Br.)	"
	Reddish white	" "	Ponceau GL (M. L. Br.)	"
	Bluish grey	" "	Ponceau for lakes G extra (Mühl.)	"
	Light bluish grey	" "	Fast brown GR (Berl.)	"
	White	" clear	Pigment-red B in pulp (M. L. Br.)	...
	Yellowish white	" turbid	Curcumein extra f. (Leipzig)	Barium chloride.
	Reddish white	Pale yellowish, turbid	Curcumein GG (Leipzig)	"
9 days	White	Colourless, turbid	Permanent orange R in pulp (Berl.)	"
	Pale pink	" "	Ponceau GRI (M. L. Br.)	"
	"	Reddish, "	Ponceau 4 R (Berl.)	"
	Pale flesh-coloured	" "	Benzo-chrome-brown G (Bayer)	"
	White	Pale bluish, turbid	Benzo pure blue (Bayer)	"

Decolorised in	Remainder.	Supernatant Liquid.	Colouring Matter.	Precipitating Agent or Carrier.
10 days	White	Yellowish pink, turbid	Ponceau RRL (Berl.)	Barium chloride.
	"	Colourless, turbid	Ponceau 2 RL (M. L. Br.)	"
	Pale yellowish pink	" "	Vermilion-scarlet R (Leipzig)	"
	Reddish white	" clear	Chromotrope 6B, 8 B (M. L. Br.)	"
	Reddish violet	" "	Chromotrope 10 B (M. L. Br.)	"
	Blue green	Bluish green, turbid	Neptune-blue B (Bad.)	"
	Pale bluish, nearly white	Pale bluish, turbid	Wool-blue 5 B (Berl.)	"
	"	Pale greenish blue, turbid	New patent blue GA (Bayer)	"
	Dirty greenish blue	Pale greenish, turbid	Navy-blue BN (Bad.)	Tannin.
	Dark green	Yellowish green, clear	Turquoise blue G (Bayer)	"
	Pale greenish yellow	Pale yellowish green, clear	"	China-clay.
	Dirty yellow-green	Colourless, clear	"	Green-earth.
	Very bright yellowish green	Pale yellowish	Guinea-green 12157 (Berl.)	Barium chloride.
	Very bright bluish grey	Colourless, turbid	Fast green, bluish (Bayer)	"
10½ days	Flesh-coloured	" clear	Brilliant crocein, bluish (M. L. Br.)	"
11 days	Yellowish white	" turbid	Ponceau for lakes 3 RN (Bad.)	"
	Reddish white	" "	Brilliant red R for lakes (Bad.)	"
	Flesh-coloured	" clear	Pigment scarlet 3 B (M. L. Br.)	"
	White	" turbid	Chloramine-brown G (Bayer)	"
12 days	Pale pink	" "	Ponceau G for lakes (Bad.)	"
	"	" clear	Crystal-scarlet 6R (M. L. Br.)	"
14 days	White	" turbid	Astacin-red B (Bad.)	"
	"	Sulphur-yellow, turbid	Benzo-chrome-brown R (Bayer)	"
	Dirty red-violet	Pale reddish, clear	Leather-red R (Bayer)	"
	Yellowish olive-green	Pale yellowish, clear	Victoria pure blue (Bad.)	Tannin.
	Very bright yellowish green	Colourless, clear	"	China-clay.
	Pale bluish white	" turbid	Acid-green L (Bayer)	Barium chloride.
15 days	Bluish grey	Pale yellowish green, turbid	Blue for lakes CB (Cass.)	"
	Grey	Colourless, clear	Dianil-blue G, B (M. L. Br.)	"
16 days	Ochreish-coloured	Sulphur-yellow	Citronin R _∞ (Oeh.)	"
18 days	White	Colourless, turbid	Ponceau for lakes B extra (Mühl.)	"
20 days	"	" "	Bordeaux for lakes B (Berl.)	"
	Pale reddish blue	Pale bluish, "	Wool-blue R, BB (Berl.)	"
30 days	Ochreish-coloured	Faintly brownish	Azo-yellow O (M. L. Br.)	"
	"	" "	Paper-yellow RR (Bad.)	"

Decolorised in	Remainder.	Supernatant Liquid.	Colouring Matter.	Precipitating Agent or Carrier.
3 weeks	White	Colourless, clear	Mikado-yellow G (Mühl.)	Barium chloride.
	"	" "	Mikado golden-yellow 2 G, 4 G (Mühl.)	"
	"	" "	Mikado golden-yellow 6 G, 8 G (Mühl.)	"
	Pale bluish pink	" "	Ponceau 5 R (M. L. Br.)	"
5 weeks	"	" turbid	Erythrine X for lakes (Bad.)	"
	Dull bluish pink	" "	Permanent red 6 B (Berl.)	"
6 weeks	Pale pink	" clear	Ponceau for lakes L (Mühl.)	"
3 months	White	" turbid	Pigment-red G in pulp (M. L. Br.)	"
	"	" clear	Autol-red BGL in pulp (Bad.)	"
	"	" "	Pigment-purple A in pulp (M. L. Br.)	"

The difference in the time required for decolorisation is only distinctive for cases in which by other reactions the specimen is proved to belong to a class represented by a large number of coal-tar colours, as, for instance, the azo colours, the members of which have a great range of colour but are otherwise very similar. Every colour analyst knows from experience how important it is to differentiate carefully the G or R brand of a group of orange or ponceau coal-tar colours, as shades of the same colour may be obtainable in various ways and yet the other properties may differ widely from that of the sample to be matched. For instance, a lake of the same shade can be produced from a yellowish brand of eosine and a bluish ponceau, or from an orange coal-tar colour and a bluish brand of eosine; but the two lakes will then differ much in shade if used as varnish paints, a difference of behaviour met with not only in coal-tar colour lakes but even in brands of orange and ponceau having the same designation supplied by different makers.

For these reasons the analysis of lakes from one colouring matter must really be most accurate, and the accuracy is still more important for combined lakes, as, owing to the greater variety of combination in them, a lake based on an analysis not sufficiently precise is more liable to have properties different from those of the original.

From the following *example of an analysis of a combined aniline lake*, made by the author, it will be readily seen how greatly the times required for decolorisation facilitates the exact differentiation of one or more colouring matters, and how easily the simplicity and accuracy of the method can be checked by every analyst.

The lake in question is known as a *dark geranium lake*, and used for printing purposes.

	Indicative of	Remarks.	Proved to be present.
<p><i>A. Tests for Solubility—Class I. :—</i> <i>In hot water:</i> Fairly soluble. Solution: reddish orange, turbid. <i>In alcohol:</i> Fairly soluble, yellow-red. Solution: greenish yellow fluorescence. <i>In acetic acid:</i> Fairly soluble. Solution: yellowish orange, turbid.</p> <p style="text-align: center;"><i>After 10 hours' standing:</i></p> <p><i>Aqueous solution:</i> Clear, no other change. <i>Alcoholic solution:</i> Clear, more bluish red; by reflected light, strong greenish yellow fluorescence. Res.: lively bluish red. <i>Acetic acid solution:</i> Clear, more reddish orange. Res.: lively yellowish red.</p>	<p>Azo-orange or yellowish ponceaus, Eosine or erythrosine yellowish, or Red azo colours.</p> <p style="text-align: center;">...</p>	<p>If eosine or erythrosine alone were present the lake would belong to the fifth group of solubility; precipitations with eosine and with erythrosine are insoluble or soluble in traces only in hot water (lead precipitation). The solubility of the lake in question in water indicates its being a complex one.</p> <p>Alcoholic solutions of precipitations with eosine are always bluish red by reflected light. The colouring matters here present seem to be insoluble in alcohol. Precipitations of eosine form <i>golden-yellow</i> solutions with acetic acid; the residue becomes colourless after standing a certain time (on white carriers). Erythrosine is <i>insoluble</i>, or soluble in traces only, in acetic acid. The colouring matter in this case is soluble in acetic acid.</p>	<p>The colouring matters present, therefore, belong to Class III., being soluble in hot water and in acetic acid, but insoluble in alcohol.</p>
<p><i>B. Reaction with Sulphuric Acid:—</i> <i>Fiery reddish orange.</i></p> <p>Op. I.: Yellowish pink, turbid; later on, more yellowish orange and white residue. Op. II.: Res.: yellowish orange. Top liq.: yellowish red, clear. Op. III.: Ether zone: brilliant <i>golden-yellow</i>. A drop of the etheric solution on filter-paper (after evaporation of the ether) becomes eosine-coloured, yellowish red, the outermost zone of which is very bluish red.</p>	<p>Orange ENL (Cass.) Ponceau 4 GBL (Berl.) Red azo colours.</p> <p style="text-align: center;">"</p> <p>Eosine, Azo-orange, Ponceau yellowish.</p>	<p>The test for eosine being the golden-yellow tint produced in the ether zone by precipitation with strong sulphuric acid, the colouring matter in this case appears to be carmine-coloured by sulphuric acid, as this also yields a golden-yellow with fiery orange-red.</p>	
<p><i>C. Reaction with Caustic Soda:—</i> 1. Caustic soda 40° Bé.: Brilliant carmine-red, gradually becomes browner. Top liq.: at first, colourless.</p>	<p>All G and R brands of ponceaus and scarlets, also Orange RL (Leipzig), Fast orange O (Höchst.)</p>	<p>Fast orange O cannot be present, as strong sulphuric acid turned a bluish Bordeaux-red. In a mixture with eosine (precipitated) Fast orange O could not produce a fiery orange-red tint.</p>	<p>Eosine-bluish.</p>

	Indicative of	Remarks.	Proved to be present.
<p><i>C. Reaction with Caustic Soda:—</i> <i>After 10 hours:</i> Res.: deep maroon tint. Top liq.: blue-violet, clear.</p> <p>2. Caustic soda 12° Bé.: Completely decomposed. Res.: white. Top liq.: deep ruby-like coloured; later, brilliant brown-red; by reflected light, no fluorescence.</p>			Eosine.
<p><i>D. Reaction with SnCl₂ + HCl:—</i></p> <p>1. 0.5 gr. of the powdered lake is treated with 5 c.c. SnCl₂ + HCl solution; fiery carmine tint. Top liq.: colourless.</p> <p>2. 0.5 gr. of a bluish eosine standard lake is treated with 5 c.c. SnCl₂ + HCl solution and the two compared.</p> <p><i>After 10 hours:</i> No change.</p>	<p>...</p> <p>This excludes: Orange ENL (decolorised in 2 hours), Ponceau 4 GBL (decolorised in 6 hours), Orange RL (decolorised in 10 hours).</p>	<p>The carmine tint proves the presence of other colouring matters besides eosine; pure eosine precipitations become yellowish orange-red with SnCl₂ + HCl solution without any further change. If the admixed colouring matter is decolorised by SnCl₂ + HCl, mixture 1 will show the tint of pure eosine lake after a certain time.</p> <p>Types of G or R brands of ponceaus or scarlet only are present.</p>	
<p><i>After 72 hours:</i> Mixture 1. shows exactly the same lively yellowish orange tint as mixture 2.</p>	...	...	According to Table XIV.: Palatine ponceau for lakes G, or Ponceau 44099.

The lake in question was therefore combined from Eosine bluish and Palatine ponceau for lakes G (Bad.) or Ponceau 44099 (Berl.). By matching some trials with Eosine BB (M. L. Br.) together with Palatine scarlet for lakes G, the shade of the lake in question was really exactly obtained.

The various inferences drawn from the tests may seem rather risky to the inexperienced analyst judging from the meagre details

of a written analysis, however clear they are, because the chief basis on which they rest, a clear view of the phenomena and the small frequent changes of shade, is not given. A careful comparison of the work done by the analysis with the tables will, however, render it manifest that they are correct, especially if the very smallest change of shade is taken notice of by an experienced eye.

An additional example of an analysis may be given here to prove how the tests may sometimes be simplified and shortened by analytical practice. The lake analysed was a *dark grass-green* wall-paper pulp lake. A portion of it was dried in the air and finely pulverised. The carrier was found to be sulphate of barium besides alumina with traces of calcium sulphate (gypsum). The brilliant yellowish-green shade of the lake suggested a mixture of yellow and green (eventually also blue) colouring matters.

Tests for Colouring Matters.

<p>A. <i>Solubility in:</i></p> <ol style="list-style-type: none"> Hot water: <i>insoluble.</i> Alcohol: <i>pure yellow solution.</i> Res.: bluish green. Acetic acid: after standing for a time and shaking: <i>deep emerald-green solution.</i> <p>An <i>insoluble yellow colouring matter</i> was precipitated from the acetic acid solution and remained on the surface.</p>	<p>The <i>green colouring matter</i> is therefore:</p> <p>In water, insoluble } In alcohol, insoluble } Class VII.</p> <p>The <i>yellow colouring matter</i> is</p> <p>In water, insoluble } In alcohol, soluble } In acetic acid, insoluble } Class VI.</p>	<p>See p. 180. The colouring matter must be <i>Naphthol-green</i>, the others being soluble in water or alcohol.</p> <p>See p. 186. The colouring matter must be <i>Pigment-chrome-yellow L in pulp.</i></p>
<p>B. <i>Reactions with Sulphuric Acid</i> 66° Bé. :— <i>Brownish orange:</i> brilliant lemon-yellow by transmitted light. Op. I.: Sulphur-yellow. Op. II.: Golden-yellow precipitate. Top liq.: yellowish green, clear. Op. III.: <i>Brilliant lemon-yellow.</i> A drop on filter-paper becomes yellow after evaporation of the ether.</p>	<p>See p. 193, Table XII. Naphthol-green only can be present; the other colouring matters in Class VII. are therefore excluded.</p> <p>See pp. 20, 21: <i>Pigment-chrome-yellow.</i></p> <p>See pp. 166, 167: <i>Naphthol-green.</i></p> <p>See p. 191, Table XII. Besides <i>Pigment-chrome-yellow</i>, <i>Eosine-yellowish</i> is possibly indicated, the absence of which, independently of the impossibility of soda combination, is proved by the filter-paper test. (<i>Eosine yellowish</i> gives a pink spot.)</p>	<p>The substances supposed to be present were: <i>Pigment-chrome-yellow</i> and <i>Naphthol-green.</i></p> <p><i>Pigment-chrome-yellow L</i> is therefore proved to be present.</p>

C. *Reactions with Caustic Soda :*

1. NaOH 12° Bé. : decomposition. Top liq. : deep emerald-green. Res. : yellowish green.
2. NaOH 40° Bé. : decomposition. Top liq. : deep emerald-green. Res. : lemon-yellow.

Compare the reactions of Pigment-chrome-yellow L (pp. 20, 21) and Naphthol-green (pp. 166, 167) with soda lye of 12° and 40° Bé.

D. *Reaction with SnCl₂ + HCl :—*

After 6 days the green colouring matter is completely decomposed. Res. : yellow. Top. liq. : colourless, turbid.

Compare the reactions of Naphthol-green (pp. 166, 167) and Pigment-chrome-yellow (pp. 20, 21) with SnCl₂ + HCl.

Naphthol-green is therefore proved to be present.

Pigment-chrome-yellow L was demonstrated by the action of the lake with the SnCl₂ + HCl solution, and a similar lake was made by precipitating the colouring matter suggested, Pigment-chrome-yellow L and Naphthol-green, on barytes by means of alumina sulphate, soda, chalk, and barium chloride. Finally, by means of the tin salt solution test the presence of Naphthol-green B (Bayer & Co.) was certified (Class VII.), as its solubility behaviour had been already suggested to the practical analyst. This example demonstrates distinctly the value of the classification of colouring matters according to their solubility for the analysis of aniline lakes.

TABLE XV.

THE FASTNESS TO LIGHT OF COAL-TAR COLOUR LAKES.*

<i>Very fast to light</i> are lakes from	<i>Fairly fast to light</i> are lakes from
Auramine on green-earth	Pigment-chlorine GG in pulp (M. L. Br.)
Citronin (Mühl.)	Auramine on China-clay
Naphthol-yellow	Mikado golden-yellow G, GG, 4 G, 8 G (Mühl.)
Pigment-chrome-yellow L in pulp (M. L. Br.)	Chloramine-yellow GG (Bayer)
Fast orange O (M. L. Br.)	Paper-yellow GG, R (Bayer)
Pigment-orange R in pulp (M. L. Br.) becomes slightly reddish	Indian-yellow R (Bayer)
Red for lakes 101 (Berl.)	Paper-yellow A, 3 G (Bad.)
Ponceau 3 RL (M. L. Br.)	Astacin-yellow (Bad.)
Helio fast red G in pulp (Bayer)	Azo-yellow O (M. L. Br.)
Permanent red 6 B, R, 4 B (Berl.)	Orange extra (Cass.)
Pigment-scarlet 3 B (M. L. Br.)	Permanent orange R in pulp (Berl.), becomes reddish
Pigment-red B, G in pulp, H (M. L. Br.)	Autol-orange in pulp (Bad.), becomes reddish
Red for lakes P in pulp (M. L. Br.)	Ponceau 2 RX (Beyer & Kegel)
Autol-red G, BL in pulp (Bad.)	Excelsior-ponceau for lakes JN, JJN (Cass.)
Lithol-red R in pulp C (Bad.)	Ponceau for lakes LE, 3 RN, RZ (Bad.)
Astacin-red B (Bad.)	Ponceau RR for lakes (Bad.)
Bordeaux for lakes B (Berl.)	Helio-purpurin 7 BL, 10 BL (Bayer)
Helio fast blue BL, SL (Bayer)	Guinea-red 4 R (Berl.)
Capri-blue GN (Mühl.) on green-earth	Scarlet 3 BL (Berl.)
Methylene-blue BB (M. L. Br.)	Autol-red BGL (Bad.)
Methylene-blue BG (Bad.)	Rhodulin-red C (Bayer) on green-earth
Methylene-blue BH (Bad.)	Brilliant rhodulin-red (Bayer) on green-earth
New methylene-blue F, FR (Bayer), precipitated by tannin especially on green-earth	Cresyl fast violet 2 B (Mühl.) on green-earth
Naphthol-green.	Methyl-violet 2 R (M. L. Br.) on green-earth
Brilliant green on green-earth	Methylene-violet BN powder (M. L. Br.) on green-earth
Malachite-green on green-earth	Rhodulin-violet (Bayer) on green-earth
	Rhodulin-heliotrope (Bayer) on green-earth
	Helio-violet RL (Bayer)
	Benzo fast blue BN, 5 R (Bayer)
	Navy-blue BN (Bad.) on green-earth
	Capri-blue GN (Mühl.) with tannin and antimony salt
	Methylene-blue R (M. L. Br.)

APPENDIX. [TRANSLATOR.]

Alizarine-red
 Cotton-red (Berl.)
 Lacitin-red 3 B (Dahl.)
 Heliobordeau (Bay.)
 Pigment-rubin (M. L. Br.)
 Hansa-yellow (M. L. Br.)
 Pigment fast yellow (M. L. Br.)
 Indian-blue S (Bad.)
 Artif. indigo

Astacin-red G extra (Bad.)
 Lacitin-red B, G, R (Dahl.)
 Lithol-red GG (Bad.)
 Flavazin 3 GL (M. L. Br.)
 Lanacyl-violet 3 B (Cass.)
 Oxamin-blue GN (Bad.)

* Lakes not mentioned here, so far as concerns Part I., are only slightly fast to light.

ALPHABETICAL INDEX

OF THE ANILINE COLOURS DESCRIBED IN PART I.

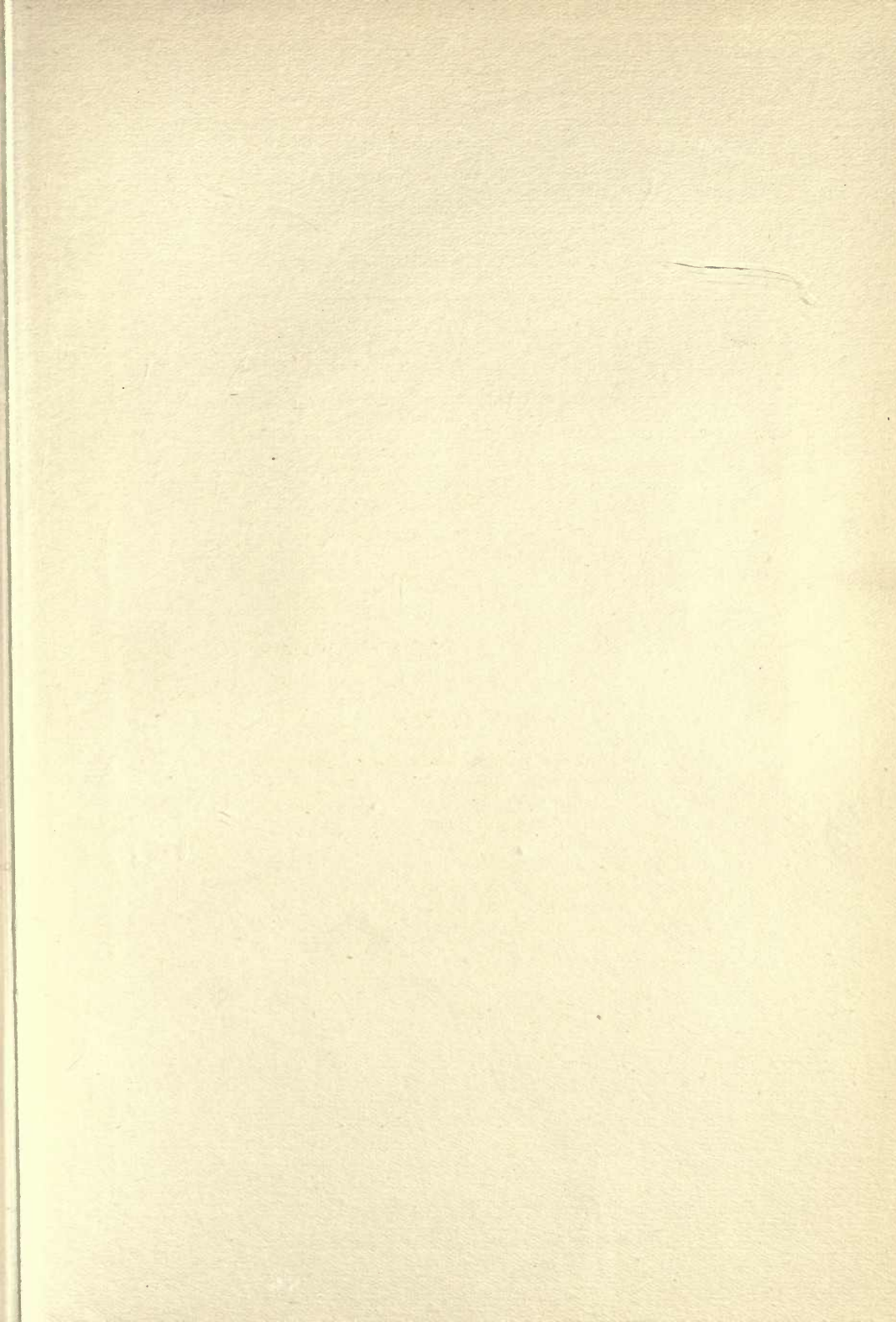
- ACID-CARMININE B** (Oeh.), 74.
Acid-green L (Bayer), 166.
 ,, conc. D (M. L. Br.), 160.
 ,, extra conc. (Cass.), 160.
 ,, B (Cass.), 160.
Acid-magenta, 170.
Acid-violet GBN, 4 R (Bad.), 122.
 ,, 3 RA (Bad.), 122.
 ,, N (M. L. Br.), 124.
Alizarine-blue, 170.
 ,, red, 170.
Alkali-blue 6 (M. L. Br.), 128.
 ,, 7 R (M. L. Br.), 130.
 ,, B extra, 6 B, 5 R (Bad.), 132.
 ,, for printing ink (Bad.), 134.
 ,, 5 B, 7 B, H 7 B (Oeh.), 142.
Amaranth B (Cass.), 66.
Astacin-red B (Bad.), 50.
 ,, yellow R (Bad.), 18.
Auramine O, 9.
Autol-orange in pulp (Bad.), 36.
 ,, red GL, BGL (Bad.), 84.
 ,, ,, BL in pulp (Bad.), 86.
 ,, RLP, RLP bluish in pulp (Bad.), 86.
Azo-carminine in powder (Bad.), 80.
 ,, floxine 2 G (Bayer), 78.
 ,, yellow O (M. L. Br.), 18.
- BENZO-AZURIN G** (Bayer), 138.
 ,, Bordeaux-red 6 B (Bayer), 78.
 ,, chrome-black-blue B (Bayer), 140.
 ,, chrome-brown G (Bayer), 22.
 ,, R (Bayer), 24.
 ,, dark green GG (Bayer), 166.
 ,, fast blue BN, 5R (Bayer), 136.
 ,, ,, scarlet 5 BS (Bayer), 72.
 ,, ,, ,, 4 BS (Bayer), 73.
 ,, ,, violet R (Bayer), 124.
 ,, green G (Bayer), 168.
 ,, pure blue (Bayer), 140.
 ,, purpurin 4 B (Bayer), 74.
Bismarck-brown F (Bayer), 22.
Blue BSHL (Oeh.), 140.
 ,, for lakes CB (Cass.), 126.
 ,, ,, I (Bad.), 132.
Blue-green S (Bad.), 160.
Bordeaux G, double conc. (Bayer), 64.
 ,, red for lakes (Berl.), 84.
 ,, ,, R, O (M. L. Br.), 70.
- Brilliant acid carmine G**, 6 B (Oeh.), 72.
 ,, ,, green 6 B (Bayer), 166.
 ,, azurin B, 5 G (Bayer), 138.
 ,, benzo-blue 6 B (Bayer), 140.
 ,, carmine L (Bad.), 50.
 ,, crocein 9 B (Cass.), 64.
 ,, ,, B, M (Cass.), 64.
 ,, ,, B₀₀, M₀₀ (Cass.), 66.
 ,, ,, B, BB, 5 B, bluish (M. L. Br.), 68.
 ,, ,, yellowish, R (M. L. Br.), 70.
 ,, ,, 3 B conc. 20712 (Bayer), 78.
 ,, double scarlet 3 R (Bayer), 72.
 ,, green, 168.
 ,, helio-purpurin B (Bayer), 62.
 ,, orange G, R (M. L. Br.), 30.
 ,, ponceau G (Cass.), 40.
 ,, red for lakes R in pulp (M. L. Br.), 82.
 ,, ,, G, R (Bad.), 48.
 ,, rhodulin-red B (Bayer), 110.
- CAPRI-BLUE GN** (Mühl), 148.
Chloramine-brown G (Bayer), 24.
 ,, orange G (Bayer), 32.
 ,, yellow GG (Bayer), 10.
 ,, yellow M (Bayer), 10.
Chromotrop 6 B (M. L. Br.), 74.
 ,, 8 B, 10 B (M. L. Br.), 76.
Chrysoidin O, 22.
Chrysophenin G (Bayer), 14.
Citronin, 9.
 ,, G₀₀₀, R₀₀ (Oeh.), 18.
Cloth-red O (M. L. Br.), 66.
 ,, yellow G, R (Oeh.), 18.
Coerulein, 170.
Columbia fast scarlet 4 B (Berl.), 76.
Congo-orange G (Bayer), 84.
Cotton-blue O, soluble (M. L. Br.), 126.
 ,, OO (Oeh.), 140.
Cresyl fast violet 2 B (Mühl), 112.
Crocein-scarlet 10 B (Bayer), 76.
Crystal-ponceau 6 R (M. L. Br.), 68.
Curcumein GG, extra fine (Beyer), 20.
- DIANIL-BLUE B** (M. L. Br.), 128.
 ,, G (M. L. Br.), 128.
Direct yellow R (Bayer), 12.

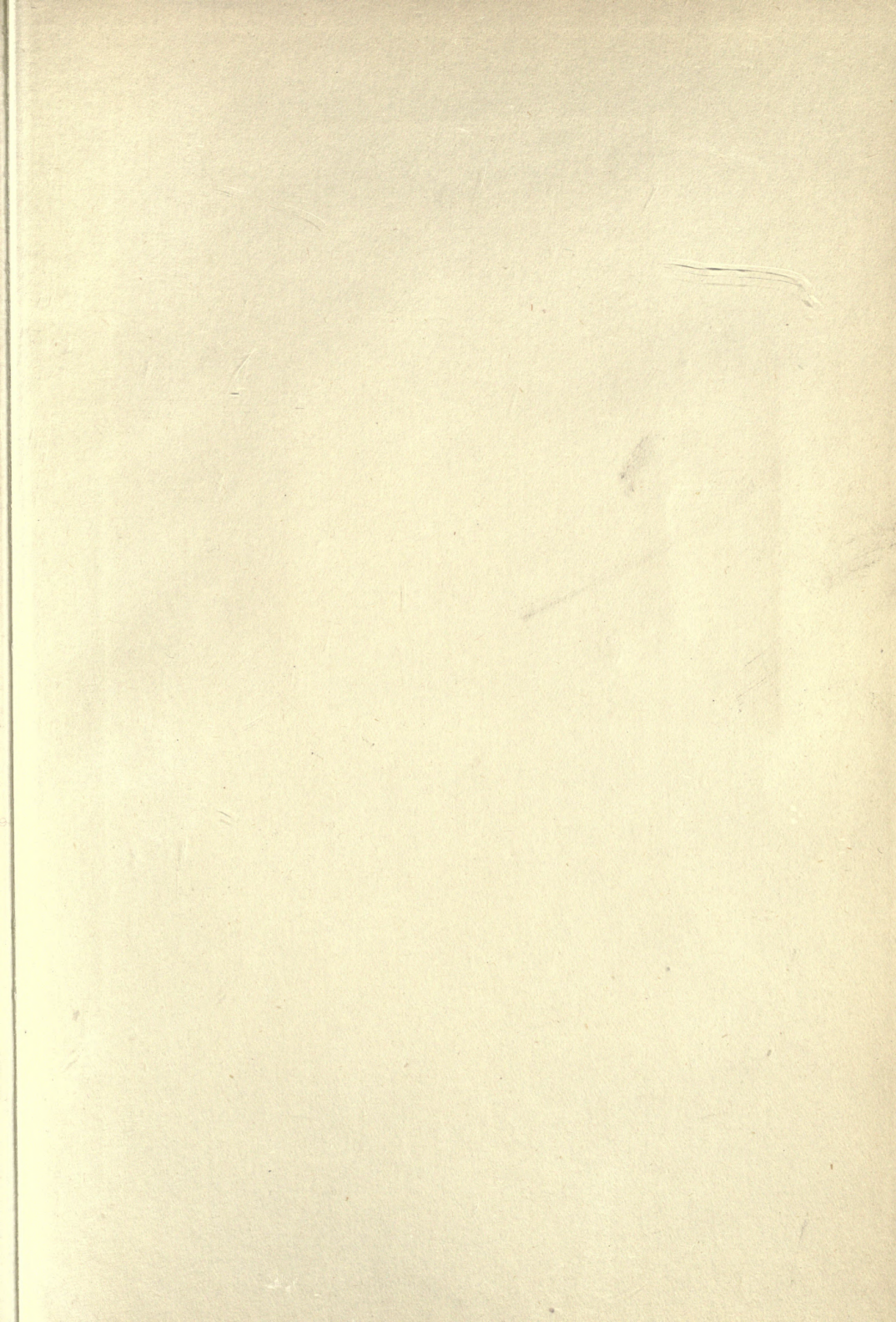
- EOSINE A, 442 N (Bad.), 90.
 ,, yellowish, for lakes, W (Bad.), 88.
 ,, AG 2 L (M. L. Br.), 90.
 ,, A 5 G, BB extra, extra 5 B
 (M. L. Br.), 92.
 ,, H 7 G (Bad.), 88.
 ,, W (Bad.), 90.
 Erythrin X for lakes (Bad.), 50.
 Erythrosine B, yellowish (Cass.), 94.
 Excelsior-scarlet for lakes JN (Cass.), 38.
 ,, ,, JJN (Cass.), 40.
- FAST acid-violet A 2 R (M. L. Br.), 122.
 ,, B, RO (M. L. Br.), 122.
 Fast brown GR (Berl.), 24.
 ,, green, bluish (Bayer), 166.
 ,, light yellow G (Bayer), 12.
 ,, navy-blue R (Oeh.), 158.
 ,, orange O (M. L. Br.), 30.
 ,, ponceau B (Bad.), 52.
 ,, red AV (Bad.), 48.
 ,, ,, BN (Bad.), 54.
 ,, ,, BT (Bayer), 60.
 ,, ,, E conc. 130 (Bayer), 64.
 ,, yellow (M. L. Br.), 170.
 Formyl-violet S 4 B (Cass.), 120.
- GREEN for lakes BW (Cass.), 160.
 Guinea-green B, B extra (Berl.), 164.
 ,, 12157 (Berl.), 164.
 Guinea-violet 4 B (Berl.), 124.
- HELIO-AZURIN RL, BL (Bayer), 138.
 ,, fast blue BL, SL (Bayer), 136.
 ,, fast red G in pulp (Bayer), 84.
 ,, purpurin 3 BL, 5 BL, 10 BL (Bayer),
 62.
 ,, violet RL (Bayer), 124.
- INDIAN-YELLOW R (Cass.), 12.
- LEATHER-RED R (Bayer), 78.
 Light green SF yellowish, SL (Bad.), 162.
 Lithol R in pulp (Bad.), 82.
 ,, red GG, R (Bad.), 170.
- MAGENTA in powder AB, dark (Bad.), 106.
 Malachite-green, 168.
 Manchester-brown EE (Cass.), 22.
 Mandarin G extra, RL (Berl.), 32.
 Metanil-yellow extra (Berl.), 16.
 ,, extra conc. 4347 SV (W.
 ter Meer), 16.
 ,, 26060 I (W. ter Meer), 16.
 Methyl-violet B extra (Bad.), 118.
 ,, BBN (M. L. Br.), 116.
 ,, BB, 2 R (M. L. Br.), 114.
 ,, R (M. L. Br.), 112.
 Methylene-blue B, BH (Bad.), 152.
 ,, BG (Bad.), 150.
 ,, BB (M. L. Br.), 150.
 ,, R (M. L. Br.), 148.
 Methylene-violet RRA, 116.
 ,, BN powder (M. L. Br.),
 118.
- Mikado golden-yellow G, 2 G, 4 G, 6 G,
 8 G (Mühl.), 10.
 ,, orange, 3 RO, 4 R (Mühl.), 36.
 ,, yellow G (Mühl.), 10.
 Milling yellow OO (Cass.), 9.
 Mordant yellow G, R (Bad.), 14.
- NAPHTHOL-GREEN B (Bayer), 166.
 ,, yellow S, 14.
 Navy-blue BN (Bad.), 144.
 Neptune-blue B (Bad.), 134.
 ,, green G, 170.
 ,, ,, S, SB, SBN (Bad.), 162.
 ,, ,, SG (Bad.), 164.
 New magenta O (M. L. Br.), 102.
 ,, methylene-blue BB (Bayer), 158.
 ,, ,, F, FR (Bayer), 156.
 ,, ,, GG (Cass.), 146.
 ,, patent-blue GA (Bayer), 140.
- OPAL-BLUE, bluish (M. L. Br.), 128.
 ,, greenish, reddish (M. L. Br.),
 126.
- Orange II (Cass.), 28.
 ,, B (Bayer), 34.
 ,, G extra, RL (Bayer), 26.
 ,, extra (Cass.), 26.
 ,, ENL (Cass.), 28.
 ,, II L (Bad.), 32.
 ,, ,, L, II R (M. L. Br.), 28
 ,, A (Mühl.), 28.
 ,, A extra (Bad.), 32.
 ,, II 35462, extra conc. 52 SE
 (W. ter Meer), 26.
 ,, for lakes ON (Bad.), 30.
- PALATIN-PONCEAU for lakes G, GG (Bad.),
 46.
 Paper yellow A, 3 G (Bad.), 14.
 ,, RR (Bad.), 16.
 ,, GG, R (Bayer), 12.
 Paraphosphin, 20.
 Patent-blue A, L (M. L. Br.), 130.
 Permanent orange R in pulp (Berl.), 36.
 ,, red 6 B in pulp (Berl.), 82.
 Phloxine BA extra (M. L. Br.), 94.
 ,, BA extra O, GA extra, GA
 extra O (M. L. Br.), 96.
 Phosphine 2 G, 3 R (M. L. Br.), 20.
 Picric acid, 170.
 Pigment Bordeaux-red N, R in pulp
 (M. L. Br.), 88.
 ,, chlorine GG in pulp (M. L. Br.),
 9.
 ,, chrome - yellow L in pulp
 (M. L. Br.), 20.
 ,, orange R in pulp (M. L. Br.), 34.
 ,, purple A in pulp (M. L. Br.), 82.
 ,, red B in pulp, G in pulp
 (M. L. Br.), 80.
 ,, red R in pulp (M. L. Br.), 86.
 ,, scarlet BB (M. L. Br.), 66.
 Pluto-orange O (Bayer), 34.

- Ponceau BN, R for lakes, 52.
 ,, BO extra, 6 RB 58940, 64580,
 3 RL (Berl.), 58.
 ,, for lakes G, 50.
 ,, " G extra (Mühl.), 40.
 ,, " GG (Cass.), 40.
 ,, " L (Mühl.), 42.
 ,, " LE, LN (Bad.), 46.
 ,, " RZ, 3 RN (Bad.), 48.
 ,, " RR, 52.
 ,, GL, GL 57298, RL, RL 57299
 (Berl.), 54.
 ,, GR, 2 R, 3 R (W. ter Meer), 60.
 ,, GRI, GRL, GRHL (M. L. Br.), 42.
 ,, RL, 2 RL, 3 RL, 5 R, B extra
 (M. L. Br.), 44.
 ,, RRL, 3 RB, 4 R 44099, 4 GBL
 (Berl.), 56.
 Pure blue O (M. L. Br.), 128.
 Purpurin, 170.
 Pyramine-yellow G for lakes (Bad.), 16.
- QUINOLINE-YELLOW, 19.
- RED for lakes A 101 in pulp (Berl.), 84.
 ,, P in pulp (M. L. Br.), 80.
 Rhodamine B (M. L. Br.), 98.
 Rhodulin-heliotrope (Bayer), 120.
 ,, red (Bayer), 108.
 ,, violet (Bayer), 120.
 Rosaniline-blue, 170.
- Rose Bengale, NTO, TN (Bad.), 98.
 Rubin-red B (M. L. Br.), 102.
 ,, N (Berl.), 104.
 Russia-leather red N (Oeh.), 110.
- SAFRANINE BS (Cass.), 98, 100.
 ,, S 150 (Cass.), 100.
 ,, Mooo (Oeh.), 104.
 Scarlet GRL (M. L. Br.), 72.
 ,, 2 RX (Beyer), 36.
 Sulfon-yellow R conc. (Bayer), 12.
- TANNIN-HELIOTROPE (Cass.), 108.
 Thioflavine T (Cass.), 9.
 Turquoise-blue BB, G (Bayer), 154.
- VERMILION-SCARLET G, R (Beyer), 38.
 Vesuvine BL (Bad.), 22.
 ,, 4 GB (M. L. Br.), 22.
 Victoria-blue B (Bad.), 144.
 ,, pure blue (Bad.), 146.
 ,, yellow conc (M. L. Br.), 18.
 Violet for lakes R (Berl.), 124.
- WATER-BLUE R (M. L. Br.), 132.
 ,, 3 R (W. ter Meer.), 142.
 Wool-blue BB, 5 B (Berl.), 134.
 ,, R (Berl.), 136.
 ,, N (Bayer), 140.
- XYLIDIN-SCARLET R (Beyer), 38.

ABBREVIATIONS.

- Bad. = Badische Aniline and Soda Works, Ludwigshafen.
 Bayer = Bayer & Co., Elberfeld.
 Berl. = Aniline Works, Berlin.
 Beyer = Beyer & Kegel, Leipzig.
 Cass. = Cassella & Co., Frankfurt.
 M. L. Br. = Colour Works, Hoechst.
 Mühl. = Colour Works, Mühlheim.
 Oeh. = Oehler & Co., Offenbach.
 W. ter Meer = Weiler ter Meer, Uerdingen.





UNIVERSITY OF CALIFORNIA LIBRARY
BERKELEY

THIS BOOK IS DUE ON THE LAST DATE
STAMPED BELOW

Books not returned on time are subject to a fine of
50c per volume after the third day overdue, increasing
to \$1.00 per volume after the sixth day. Books not in
demand may be renewed if application is made before
expiration of loan period.

OCT 10 1918

MAR 21 1927

JAN 2 1931

SEP 19 1946

NOV 11 1972 54

RETURNED TO

OCT 28 1972

LOAN AHC

SEP 26 1992

AUTO DISC

AUG 26 1992

CIRCULATION

YD 0299

U. C. BERKELEY LIBRARIES



C041190480

TP914
Z5

300474

Zuu

UNIVERSITY OF CALIFORNIA LIBRARY

