The Manufacture of Lake Pigments from Artificial Colours

Jennison Francis H
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Author: Jennison Francis H

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THE

MANUFACTURE OF LAKE PIGMENTS

FROM

ARTIFICIAL COLOURS
THE MANUFACTURE OF LAKE PIGMENTS FROM ARTIFICIAL COLOURS

BY

FRANCIS H. JENNISON, F.I.C., F.C.S.

WITH SIXTEEN PLATES SHOWING SPECIMENS OF EIGHTY-NINE COLOURS

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THE MANUFACTURE OF LAKE PIGMENTS FROM ARTIFICIAL COLOURS

CHAPTER I

INTRODUCTION

The term "lake colour" is used to distinguish pigments made from dyestuffs and colouring matters, by precipitating the colouring matter as an insoluble compound, which can then be used for pigmental purposes, to distinguish them from natural pigments, such as ochre, umber, etc., and from chemical colours manufactured by direct combination or decomposition of distinct salts, e.g., such colours as lead chromates, Chinese blue, emerald green, etc.

Until the introduction of the coal-tar dyes, lakes were made from the natural dyestuffs—cochineal, sapan wood, logwood, Lima wood, fustic, flavin, weld, etc., many of which are still in the market, and known by such names as crimson lake, berry yellow, madder lake, Dutch pink, rose lake, leather lake, etc.; but of recent years they have, but for some few and particular purposes, been superseded by lakes made from artificial colours, because the latter can be produced more easily and cheaply, and possess greater staining power, brilliancy, and constancy of shade.
To manufacture lakes from artificial dyestuffs, in order to produce the best and most economical results, to adapt the lake to the purpose for which it is required, it is necessary to understand the chemistry, constitution, and properties of the colours used.

The difficult and intricate chemistry of the production of the artificial dyestuffs does not concern the lake manufacturer, but the chemical nature of the colour he is using does; e.g., the reason why he cannot precipitate magenta with barium chloride when a scarlet is easily thrown down by this reagent requires his careful attention. A study of the constitution of colouring matters will show that the nucleus of the molecule of any given colour is not, from the actual lake-producing point of view, the essential feature of the colour, but rather the substitution and addition products of the chromophor. For instance—

Tropaolin OO is phenyl-amido-azo-benzene sulphonic acid—

\[
\text{HSO}_3\text{-C}_6\text{H}_4\text{N} \vdash \text{N-} \text{C}_6\text{H}_4\text{NHC}_6\text{H}_5
\]

or \[
\text{C}_6\text{H}_4 \downarrow \text{SO}_3\text{H} \}
\text{N \vdash N-} \text{C}_6\text{H}_4\text{NHC}_6\text{H}_5
\]

The chromophor of this colour is azo-benzene—

\[
\text{C}_6\text{H}_5\cdot \text{N} \vdash \text{N-} \text{C}_6\text{H}_5
\]

Examining the formula of the colour, it is seen that in one of the benzenes of the diazo-benzene, one of the hydrogens has been substituted by the sulphonic acid group, and in the other by an amido-benzene.

This being an acid colour, the latter substitution will be found to have no influence on the dyeing or lake-forming properties of the colour, but affects the colour of the dye by intensifying the shade, acting in this case only as an auxochrome, as Witt names this property of certain organic radicals.

The sulphonic acid rendering the colour of an acid nature, by virtue of which it is used as a dye, is the group that has