

The oldest synthetic organic dyestuff group: the history and analysis of the triarylmethane dyes

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Abstract

The present lecture focuses on the so-called triarylmethanes. This dyestuff class is the oldest synthetic organic group and produces brilliant hues, the range including reds, violets, blues and greens. During the second half of the 19th century the triarylmethane dyes played an important role for dyeing textiles and for other applications. The history of this dyestuff group is studied by the original historical sources, included the patent literature.

The start of this group was the discovery of the red-violet dye fuchsine, which was developed in the same year of the discovery of mauve but turned out to be much more important. In 1856 the Polish chemist Jakub Natanson (1832-1884) and two years later August Wilhelm Hofmann (1818-1892) obtained a red-violet dyestuff by using aniline. They were not aware of the use as a textile dye. In the same year François-Emmanuel Verguin (1814-1864), professor on the Collège of Lyon, developed a method to produce this dye, but he did not exploit this invention by himself. The production process came into the hand of the silk dyers Renard Frères & Franc in Lyon. In the next decade, several other production processes were developed and fuchsine was produced by different manufacturers.

This dye-class was extended by methyl violet, discovered by the chemist Ch. Lauth in 1860. In the year 1862 some blue dyes of this chemical group were invented, such as alkali blue, methyl blue and water blue. In the beginning and especially at the end of the 1870's and in the beginning of the 1880's greens dyes were discovered, such as methyl green (1871), malachite green (1877), brilliant green and light green SF (1879) and Victoria green (1883). Other famous dyes of this class discovered in the 1880's are crystal violet (1883) and patent blue (1888).

The triarylmethane dyes all belongs to the class of basic dyes. Analysis can be done by means of HPLC-PDA using a gradient of water, methanol and phosphoric acid, the same system used for the analysis of natural dyes.

The history, the chemical constitution, the production and the (fantasy) names of the main important dyestuffs of this chemical group will be discussed. In addition, the dyeing recipes and the use on artists' objects will be presented. Some examples of the identification of these dyestuffs both on textiles, embroideries, wall-paper, furniture and in paintings, used as organic pigments, will be given.

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