

## The early synthetic organic dyestuffs: The Ponceaus

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### Abstract

The lecture discusses one group of synthetic organic dyestuffs, the Ponceaus. The French word ponceau means 'wild corn poppy'. This dye class was discovered and patented by the German factory Farbwerke Meister, Lucius & Brüning in 1878. The dye company was founded as Meister, Lucius & Co. by Carl Friedrich Wilhelm Meister, Eugen Lucius and Ludwig August Müller in the village of Hoechst, near Frankfurt am Main, in 1862. At the end of 1864 Müller retired and Adolf Brüning was admitted as a partner. The name was changed to Meister, Lucius & Brüning in 1867. The first dyes produced were fuchsine and aldehyde green. In 1880 it became a stock company: Farbwerke vorm. Meister, Lucius & Brüning.

In 1871 Heinrich Baum (1849-1923) started to work as a chemist in the laboratory of the firm at Hoechst. In the years 1875-'76 he was inspired by the work of Johann Peter Griess, Zacharie Roussin and August Wilhelm Hofmann and he started to investigate the azo dyes. Baum discovered the  $\beta$ -naphthol-disulfonic acids R (2-naphthol-3,6-disulfonic acid) and G (2-naphthol-6,8-disulfonic acid) in 1878. The dye firm received their first German Reichs Patent 3229 for the discovery of the Ponceaus on the 24<sup>th</sup> of April 1878.

This patent is the basis of the Ponceau dyes and describes the production and the separation of the  $\beta$ -naphthol-disulfonic acids R and G; further dyestuffs prepared from both acids. Two other important patents for the Ponceaus are the German Reichs Patent 7217 of the 3<sup>rd</sup> of December 1878 and the German Reichs Patent 36.491 of the 1<sup>st</sup> of March 1884, which led to an extension of this dyestuff class. Dyestuffs made from R acid are Ponceau 2G, Ponceau 2R, Bordeaux R and Amaranth. Ponceau dyes prepared from G acid are Orange GG, Crystal Ponceau 6R and Cochineal Red A.

The Ponceau dyes on textiles (wool and silk) show different light-fastnesses. The dyes produced from R acid, such as Ponceau 2G, Ponceau 2R and Bordeaux R, have a poor light-fastness; they are strongly fading within several weeks. The dyes made from G acid, such as Orange GG, Crystal Ponceau 6R and Cochineal Red A, show a good light-fastness and they hardly changed within several weeks.

The history, the chemical constitution, the production and the names of the different Ponceau dyestuffs will be presented. Additionally the identification of these dyes will be demonstrated by case-studies on different art-objects.

Name	C.I. Name	C.I. Number	Constitution
Ponceau 2G	Acid Orange 14	16100	aniline and R acid
Ponceau 2R	Acid Red 26	16150	2,4-xylidine and R acid
Bordeaux R	Acid Red 17	16180	1-naphthylamine and R acid
Amaranth	Acid Red 27	16185	naphthionic acid and R acid
Orange GG	Acid Orange 10	16230	aniline and G acid
Crystal Ponceau 6R	Acid Red 44	16250	1-naphthylamine and G acid
Cochineal Red A	Acid Red 18	16255	naphthionic acid and G acid
Ponceau 6R	Acid Red 41	16290	naphthionic acid and 2-naphthol-3,6,8-trisulfonic acid

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