

## THE HISTORY OF DYES

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In the modern world, every person evaluates any object by its external characteristics, among which are coloring (dye), and color. Dyes are used in the most diverse spheres of activity - food, textile, light, chemical, printing industry, etc. But no one thought about how and when people started to paint different materials. After all, people used dyes since ancient times, and they were extracted exclusively from plant or animal raw materials.

The first use of dyes was in the Neolithic era. Then use mineral pigments, such as cinnabar, and ocher. As early as 15,000 years ago, cave dwellers in Beijing began painting their caves with red iron oxide mineral pigments [1].

One of the most common dyes of ancient times is indigo. It was obtained from special tropical plants of the genus *Indigofera* (indigo) in India. The leaves of these plants were loaded into large vats or simply into pits and filled with water. There they fermented, the products of fermentation were gradually oxidized by the oxygen of the air and as a result, indigo came out, which slowly settled to the bottom in the form of blue flakes. Later this dye got to Europe. In Europe and Russia, indigo was obtained from *Isatis tinctoria* plants [2].

One of the oldest dyes is purple. In the 10th century B.C., the Phoenicians obtained it from purple snails (*Murex brandaris*). To obtain one gram of purple, it was necessary to process ten thousand snails. For several centuries, purple was the most valuable of all dyes [3].

The main yellow dye of the ancient East, Greece, and Rome was saffron. Today we use it as a spice and add it to the dough, and in those days in Rome, saffron was used to paint the streets along which the emperor returned with a victorious army.

At that time, a dye obtained from cochineal insects, which parasitizes plants from the cactus family, was known. 150,000 dried insects were needed to prepare one gram of dye.

The most common red dye was a dye extracted from a madder root. The dye of madder is alizarin. The dye itself has a yellow color, and the red color is given only after interaction with aluminum salts [2].

Natural dyes were scarce and expensive, which necessitated the use of synthetic dyes. The first synthetic dye was obtained in 1855 by the Polish chemist, and professor at Warsaw University, J. Natanson. When aniline was heated with dichloroethane, it obtained a bright red dye called fuchsin.

In 1856, the English chemist N.R. Perkin, trying to synthesize quinine, isolated a purple dye (Mauveine) from the dark precipitate formed by the interaction of aniline with potassium dichromate.

In 1868, K. Gräbe and C.T. Lieberman synthesized alizarin from anthracene. Previously, alizarin was obtained from madder root.

Then eosin and other phthalein dyes were synthesized (A. Baeyer and H. Caro). Today, there are more than 15,000 dyes of various shades belonging to different classes of compounds [3].

References:

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3. <https://olgalishchuk16.blogspot.com/2016/11/normal-0-false-false-false-ru-x-none-x.html>