



Natural and synthetic dyes

Almost any organic material produces a colour when boiled in a dye-bath, but only certain plants yield¹ a colour that acts as a dye. Natural dyes are obtained from different parts of plants and also from animals.

The following categories of natural dyes can be identified:

- leaves and stems;
- twigs and prunings²;
- flower heads;
- barks;
- roots;
- outer skins, hulls, and husks³;
- heartwoods and wood shavings;
- berries and seeds;
- lichens;
- insect dyes.

Various types of yellow are produced from the dried and powdered stigmas of the saffron plant, from the bark of the pomegranate tree, from curcuma. Reds are obtained from the root of the *Rubia tinctorum*, from the dogwood tree, from molluscs and also from two insects (cochineal red and kermes). From henna leaves different shades are achieved, such as brown, dark brown, reddish brown, golden yellow. Blue indigo is taken from the leaves of *Indigofera tinctoria*. From nut husk a variety of colours are obtained, from beige to black.

The types of synthetic dyes that are available for use in the textile dyeing process are categorised according to the following groups.

Acid Dyes

They are fast to light and to washing. They are named acid dyes because they work best when applied in an acid bath. They are mainly used on nylon, silk, and wool.

Azoic (or Naphthol) Dyes

Extremely fast to light, they are commonly used to dye red, orange or brown. They are mainly used on cotton.

Basic Dyes

They can always create a brilliant colour. They are mainly used on acrylic fibres, but they are also sometimes used for wool and silk. This dye is also used to colour paper. **Acetic acid** is usually added to the bath to help in the quick penetration of the dye onto the fibre.

Chrome (or Mordant) Dyes

They are rather fast to light and to washing. They are especially useful for black and navy shades. The choice of mordant is very important as different mordants can alter the final colour significantly. These dyes are mainly used for wool and silk.

Direct Dyes

This type is one of the easiest to use and has a wide range of colours, it is not fast to washing, but its fastness is often improved by more treatment. It is mainly used on cotton, rayon, wool, silk, and nylon.

GLOSSARY

- 1** to give way, to relinquish
- 2** any small branch or shoot of a tree
- 3** the external green covering of certain fruits and seeds





GLOSSARY

4 (to grind) to reduce or be reduced to small particles by pounding or abrading

Disperse (or Acetate) Dyes

These dyes are finely ground⁴ in the presence of a dispersing agent, and their dyeing rate is greatly influenced by the dispersing agent used during the grinding. Disperse dyes were developed because other dyes would not work with acetate. They are also used on different manmade fibres, including acrylic and polyester.

Reactive (or Fiber-reactive) Dyes

This type of dyes has a good fastness to light and to washing. Reactive dyes create a strong chemical bonds with the material being dyed and so they are the most permanent of dyes. This dye is by far the best choice for dyeing cotton, nylon, wool and other cellulose fibres at home or in art studios.

Sulphur Dyes

They are especially fast to washing and they are a good option for material that is washed frequently. Sulphur dyes are colourless, but on exposure to air they oxidise and turn into their respective colours. They are mainly used on cotton, linen, and rayon.

Vat Dyes

This type is superior compared to the other dye when it comes to its fastness to light and to washing. Vat dyes like sulphur dyes must oxidise before their real colour comes out. This dye is mainly used for cotton, linen, wool, and silk. The indigo colour of blue jeans is an example of vat dye.

(Adapted from www.practicalaction.org and www.hubpages.com)



ACTIVITIES

1 Complete the table writing the colours obtained from the natural sources given.

Source	Colour	Source	Colour
Indigofera tinctoria		Nut husk	
Insects		Pomegranate	
Henna leaves		Molluscs	
Saffron		Curcuma	

2 What types of synthetic dyes are...

- | | | | |
|---------------------------|-------|--------------------------|-------|
| 1 resistant to light? | ..... | 9 used on linen? | ..... |
| 2 resistant to water? | ..... | 10 used on acetate? | ..... |
| 3 not resistant to water? | ..... | 11 used on acrylic? | ..... |
| 4 used on nylon? | ..... | 12 used on polyester? | ..... |
| 5 used on silk? | ..... | 13 used to colour paper? | ..... |
| 6 used on wool? | ..... | 14 the most permanent? | ..... |
| 7 used on cotton? | ..... | 15 initially colourless? | ..... |
| 8 used on rayon? | ..... | 16 the best for jeans? | ..... |