

A Review on Textile Dyes

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Abstract - A review on the introduction and classification of textile dyes. In this review we discuss about the classification of dyes and uses of Textile dyes. Basically a dye is a coloured compound, normally used in solution, which is capable of being fixed to a fabric. Dye, substance used to impart colour to textiles, paper, leather and other material. Dyes are organic compounds because they contain carbon. Dyes are usually soluble in water. The dye is generally applied in aqueous solution, and may require a mordant to improve the fastness of the dye on the fibre. The colour of a dye is dependent upon the ability of the substance to absorb light within the visible region of the electromagnetic spectrum (380-750nm).

Keywords- Dyes, chemical composition, colour fastness, organic compounds, natural dyes, synthetic dyes, Fibre

1. INTRODUCTION

Dye is a substance made from plants or chemicals which is mixed into a liquid and used to change the colour of cloth. These are organic compounds which are widely used to imparting colour to textiles. They are produced either chemically or from plants. The important point about dyes, that these are, unlike paint, they do not build up on the surface of the fibre but are absorbed into the pores of the material. This becomes possible because of two reasons, First, The size of the dye molecules is smaller than the size of the pores of the fibre. The second reason is the affinity of dye to the fibre due to forces of attraction. Dyeing is the process of adding colour to textile product like fibres, yarns and fabrics. The temperature and time controlling are two key factors in dyeing.

2. HISTORICAL BACKGROUND

Up to the middle of nineteenth century, the dyestuffs used for textiles were obtained from natural sources like vegetable, plants, animal and mineral sources. As these dyes were not simple water soluble substances, complex procedures were used to give rich and fast colours. The first synthetic dye, mauve was discovered by William Henry Perkin in 1856, from coal tar which was the first synthetic dyestuff.

3. CLASSIFICATION OF DYES

A very common classification of the dyestuff based on the source of materials are as follows.

1. Natural Dyes

2. Synthetic Dyes

Natural dyes are derived from nature through organic and inorganic materials or sources. These are further classified as,

1. Vegetable dyes

2. Animal dyes

3. Mineral dyes

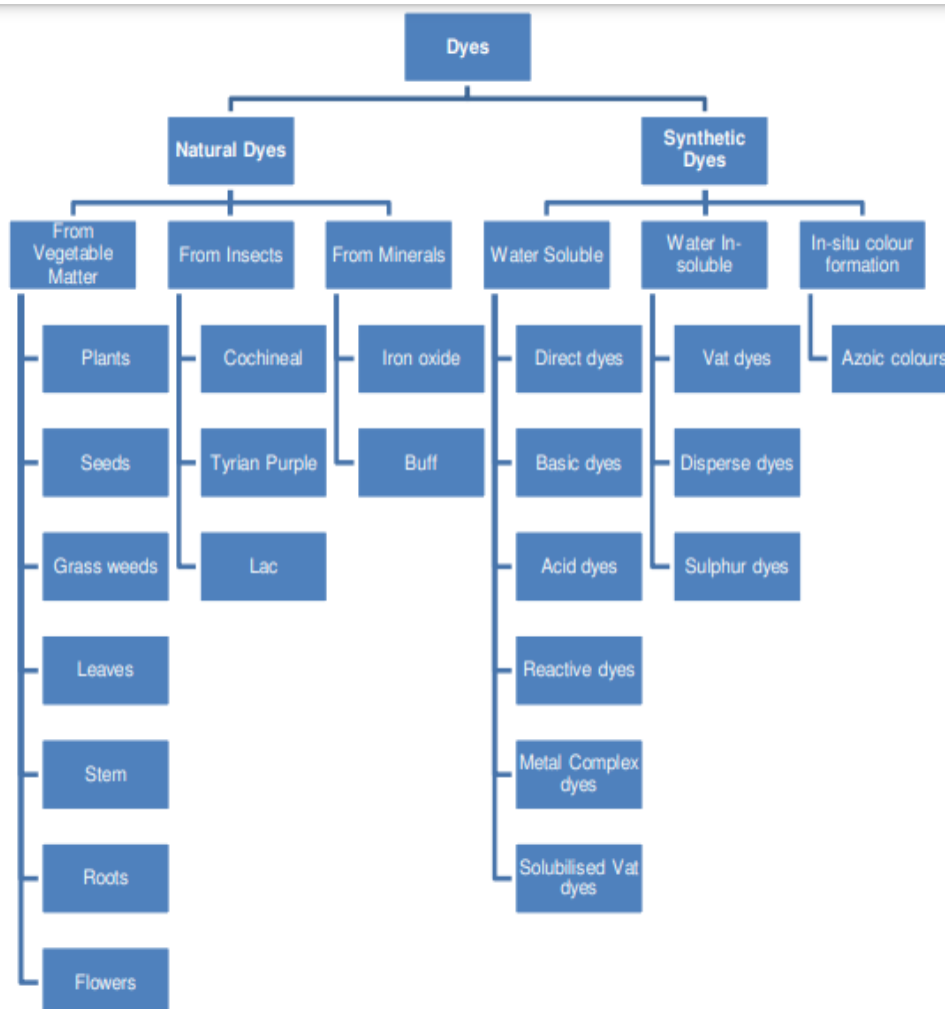
Synthetic dyes are obtained by adding chemicals to natural dyes. These are classified as,

1. water soluble dyes

2. water insoluble dyes

3. In situ colour formation

Flow Chart of classification of dyes on basis of source of origin are as follows,



1.NATURAL DYES

Natural dyes are classified into three types based on the source of origin namely vegetable dyes, animal and mineral dyes. These are colour substances obtained from natural sources. Natural dyes are used for all type of textile dyeing and printing until the middle of nineteenth century. Natural dyes are having wide application in the colouration of most of the natural fibers as cotton, linen, wool and silk fibres and some extant for nylon and polyester synthetic fibre

(A). Vegetable dyes- These are obtained from different parts of plants such as leaves ,fruits ,pods ,bark etc. These vegetable dyes can be applied directly or with some mordants. These are as follows,

- 1.Indigo(blue dyes)
- 2.Indian Madder(Red)
- 3.Turmeric(yellow)
- 4.Marrigold(lemon and orange colour)
- 5.Henna(yellowish orange)
- 6.Tea(brown)
- 7.Onion(skin)

(B).Animal dyes-These derived extracted from some insects called animal dyes.Various shades of red and purple are obtained from animal dyes.these are as follows,

- 1.Cochineal(Red bug)
- 2.Tyrian purple(Sea snails ,Royal purple)
- 3.Lac Dye(lac insect, crimson colour)

(C). Mineral Dyes- These are extracted from minerals and not being used commercially. These are as follows,

1. Iron
2. Prussian blue
3. Buff

#Advantages of natural dyes

1. They are eco friendly.
2. produces soft and soothing colours.
3. These dyes provide excellent protection from UV rays.

#Disadvantages of natural dyes

1. These are difficult to store.
2. Time consuming process.
3. Availability depends upon seasons.

2. SYNTHETIC DYES

Dyes that are produced chemically are called synthetic dyes. Synthetic dyes are referred to as "coal tar" dyes, since they are manufactured from substances which, until recently, were only obtained from coal tar. These are classified on the basis of chemical composition, that are as follows,

- (a). Direct dyes (water soluble, produce bright colours)
- (b). Reactive dyes (Used to dye cellulose, protein and polyamide fibres)
- (c). Basic dyes (Cationic dyes, produced brilliant shades)
- (d). Acid dyes (Sodium salts of organic acids)
- (e). Mordant or chrome dyes
- (f). Disperse dyes (Insoluble in water, suitable for nylon, polyester)
- (g). Vat dyes (Soluble in alkali)
- (h). Sulphur dyes (produce like navy blue, black, khaki, olive green)
- (i). Azoic dyes or Naphthol dyes (Also called ice colours, exhibit bright colours)
- (j). Pigment dyes (used in dope dyeing and printing)

#Advantages of Synthetic dyes

1. They do not need mordant.
2. They are quick drying.
3. They last longer.
4. More stable than natural
5. Bright range of colours

#Disadvantages of synthetic dyes,

1. These are petroleum based.
2. Hard to treat in wastewater.
3. Harmful effect on the environment and human beings.

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