

→ applied to wool, silk, cotton, acrylic and modacrylic fibres.

→ they give fastness and bright shades to acrylics.

→ Initially acrylic fibres are difficult to be dyed as they ^{need dye} ~~are~~ ^{difficult to dye} ~~are~~ ^{due to} lack of specific dye sites in the fibres.

② Mordant dyes :-

→ They do not dye fibres directly, but require a mordant, which can be Metal oxide (for acidic dyes) and tannic acid/tannin (for basic dyes).

→ The fibre need to be dyed is first mordanted by dipping in the solution of a metallic salt or tannin and then dipped into solⁿ of dye.

→ By this process lake is obtained which is

→ insoluble and fast to washing.

eg. Alizarin (mordant used is aluminium hydroxide)

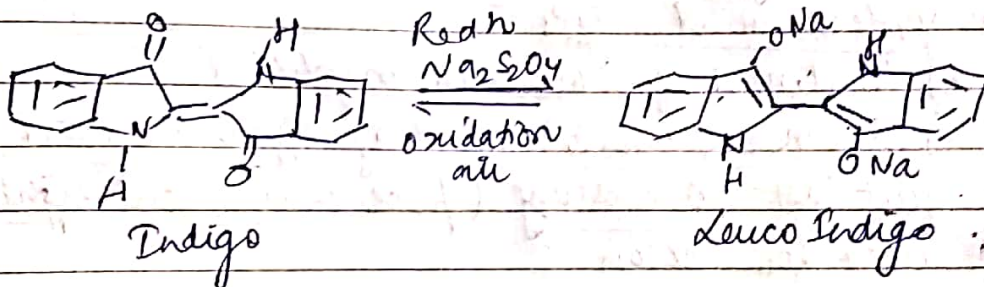


Alizarin

③ Vat dyes :-

- insoluble in water, but they made soluble by use of a strong reducing agent e.g. NaHSO_3 dissolved in NaOH .
- fastest dyes for cotton, linen and rayon.
- applied to wool, nylon, polyester etc.
- vat dyes are hot water dyes.
- hot water dyes are available in both powder & liq form.
- > These are expensive coz of initial cost as well as method of application:

=> The fabric is dipped into leuco compd solⁿ (obtained by reduction with reducing agent) & then exposed to air. By this leuco compd is oxidized back to original insoluble dye which remain firmly adhered on to the fibre.
e.g Indigo.

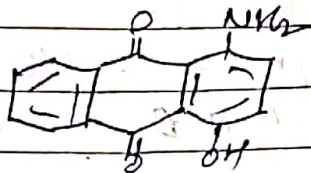


④ Disperse dyes :-

- > water insoluble dyes, mainly used for various polyester etc. To a lesser extent nylon & acrylic fibres.
- > Polyester fibres being hydrophobic and with significant crystalline content, the assistance of high temp, high pressure and carriers (which swell the fibre) is taken to achieve satisfactory dyeing.

- ⇒ These dyes are dispersed in soap solⁿ with solubilizing agent (phenol, cresol, benzoic acid etc)
- ⇒ Then the fabric is soaked in it at elevated temp & under pressure.

e.g.



1-amino-4-hydroxyanthraquinone.

⑤ Reactive dyes :-

- ⇒ These dyes produced in the fabric by itself during the process of dyeing.

- ⇒ e.g. alkaline solⁿ of β -naphthol + diazanium salt

both are same

↓
Coupling take place to produce azo dye

⑥ Azoic dyes :-

- applied in 2 stages :-

- a) treatment of fibre with naphthol
- b) treatment of above with diazotized base/salt

- ⇒ quite fast to washing & poor to excellent light fastness.

- ⇒ used for cotton

- ⇒ called also ice dyes as ice is frequently used to bring the dyes to low temp.

- ⇒ give bright colour, high intensity colour, much more so than that of common dyes.

② Reactive dyes:

- These dye remain by means of a chemical reaction b/w the dye and fibre. As such their fastness properties are excellent.
- Used for natural & synthetic cellulosic fibres, natural protein fibres and polyamide fibres.
- Dyeing can be carried out at room temp.
monochloro reactive, dichloro reactive, Tetrachloropyrimidine.

③ Sulphur dyes:

- used for natural and man made cellulosic fibres.
- Water soluble or leuco form of dye is produced through reduction of the dye with Na_2S or sod. hydro sulphide.
- Once the dye is within the fibre, the reduced sulphur dye is converted to its original insoluble form by oxidation with an oxidizing agent of sodium perborate.
e.g. indophenol & sulfur black (C19318)

Classification Based on structure :-

1) Azodyes

- contains dye grp ($-\text{N}=\text{N}-$) & in addition contain sulfonic acid grp (which improves water solubility),
-OH, $-\text{NH}_2$ etc.