

Lecture-14

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Defects of Sulphur Dyeing

1) Bronziness or Dullness of shades: It is a common defect found in Sulfur dyed textile mtl's.

Causes:

- 1) Excessive delay between lifting of the material from the dye bath and washing off.
- 2) Exposure of goods to air while dyeing.
- 3) Too much use of common salts as exhausting agents.
- 4) Insufficient Na_2S (i.e. reducing agent) in dye bath.

Remedies:

- 1) Good washing and dilute solution of Na_2S (0.1%) at 30°C or,
- 2) A treatment with boiling soap solution or a strong Na_2S solution or,
- 3) A treatment with a solution containing 10% saponified palm oil at 60°C

Defects & Stripping of Sulphur Dye with its comparison with Vat Dye

Defects of Sulphur Dyeing

2) Tendering: If Sulfur dyed textile mtl's are stored, tendering effect is seen on cellulose.

Causes:

- 1) Gradual oxidation of Sulphur to H_2SO_4 on storage.
- 2) After treatment with copper salts causes rapid tendering.
- 3) Presence of iron as an impurity causes rapid tendering.
- 4) The method of oxidation for the recon version to insoluble form influence tendering.

Remedies:

- 1) Treatment of dyed material with 1-3% of $\text{K}_2\text{Cr}_2\text{O}_7$ and 1-3% of CH_3COOH at 60°C temperature for 30 minutes followed by through rinsing.
- 2) Treatment with a little Sodium Acetate so that H_2SO_4 may be converted in to harmless acetic acid.
- 3) Using 5 gm/litre soda ash after dyeing followed by drying without rinsing.

Defects & Stripping of Sulphur Dye with its comparison with Vat Dye

Stripping of Sulphur dyes

Unevenly Dyed shades on cellulosic materials with sulphur dyes may be corrected by a treatment with a warm solution of Na_2S in the presence of polyvinyl pyrolodine.

If this method is found to be ineffective then the uneven dyed material may be treated with a solution of a NaOCl or bleaching powder (2-3 gm/litre of available chlorine).

In some cases bleaching with KMnO_4 solution may be effectively carried out.

In other cases the dyed material may be treated with warm NaOCl solution in the presence of NaOH .

Defects & Stripping of Sulphur Dye with its comparison with Vat Dye

Reason of Uneven Dyeing

The uneven dyeing of material occurs due to the following reasons:

- 1) The oxidation of dye during dyeing when the material comes in contact with air.
- 2) Presence of gummy material on the fabric.
- 3) Defective Dye.

Uses of Sulphur Dye:

- 1) To dye Umbrella cloth with sulphur black.
- 2) To dye cotton fabric
- 3) To dye rubber material hence after treatment by CuSO_4 is necessary.

Defects & Stripping of Sulphur Dye with its comparison with Vat Dye

Comparison between Sulphur and Vat Dyes

Criteria	Sulphur Dye	Vat Dye
Molecular Size	Dye molecules are very Large	Smaller than Sulphur
Shade	Gives dull shade due to varying conditions	Gives bright shades
Fabric Dyed	Cotton, Rayon, Nylon & P/C	Cellulose, Rayon etc
Hydrolysis	Under high temperature and Humidity	Susceptible to hydrolysis i.e. easy to Hydrolysis.
Wash Fastness	Good to very good	Excellent
Price	Cheaper than Vat dye	Very costly dye
Light fastness	Good to very good	Excellent for anthraquinone.
Sulphur linkage	Contain Sulphur linkage	No Sulphur linkage is present.
Ionization	The dye molecules are negatively ionized after reduction	Similar to sulphur dye.

