

ACRYLIC FIBER – CONCLUDING PART

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Dyeing of Acrylic Fiber

Dyeing of Acrylic fiber is widely done using cationic or basic dyes. These dyes can produce dark shade. Low affinity disperse dyes are also used to develop pale to medium shades.

The cationic dye powder is pasted with acetic acid and then mixed with boiling water. A stable pH of 4.5 - 5.5 can be obtained by addition of sodium acetate. Dyeing starts at 40 deg C and temperature is raised to boil to carry out the dyeing. After dyeing is complete, the bath is slowly cooled to 50-60 deg C. Then washing-off is carried out.

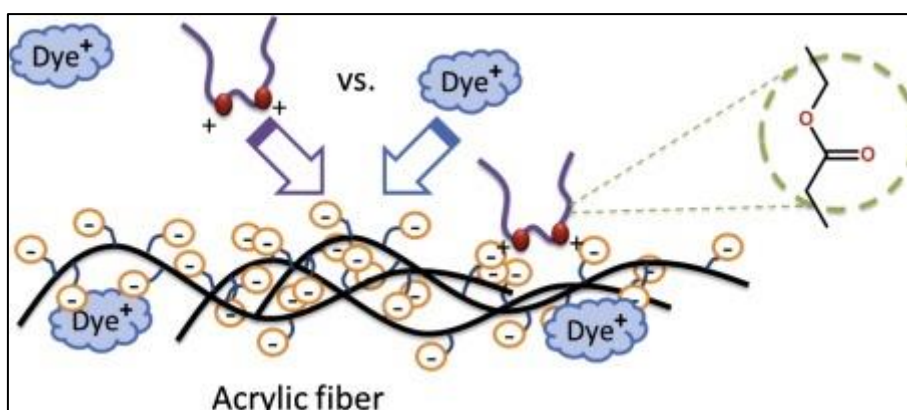


Fig 1.1 – Dyeing Mechanism of Acrylic fiber



Challenges and precautions in dyeing of acrylic fibers with cationic dyes

- Cationic dyes with delocalized cationic charges are intensely colored and it is essential to avoid dust escaping from the powders. Concentrated liquid dyes avoid this problem. Also, solid forms of these dyes are often not easy to dissolve because of their tendency to form gummy material.
- Cationic auxiliary products may have substantively for the anionic groups in the fibers and block dyeing sites whereas residues of anionic product will interact with and even precipitate the cationic dyes in the bath. So compatibility of the auxiliaries must be checked.
- Cationic dyes tend to exhaust very rapidly over a small range in temperature. Therefore, great precaution is needed to avoid uneven dyeing. The careful temperature control is required while dyeing acrylic fibers with cationic dyes is necessary to avoid this.
- It is important to know the characteristics of the acrylic polymer before dyeing. Because some of the polymers are greatly affected by dye bath pH and it is necessary to maintain for better quality of dyeing.
- If dye additions are required for shade adjustment, the bath temperature is first slowly reduced to below 80 deg c.
- Rapid cooling by addition of cold water to the dyebath can be disastrous as it causes immediate setting of creases in the goods.
- Some cationic dyes are very sensitive to traces of chlorine and will rapidly fade giving poor color fastness particularly when dyeing pale shades. An anti-chlor treatment of fabric bleached with sodium chlorite may be necessary and small additions of sodium bi-sulphate to the dyebath will avoid this type of problems.

Wishing you a great week ahead!

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