Lecture-22

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- Commercial Name
- Mechanism of Dyeing
- Methods of Dyeing

Commercial Name, Mechanism & Methods of Dyeing with Disperse Dye

Commercial Name of disperse dyes

	Name	Manufacturer	Country
1.	Terasil	Cibageigy	Switzerland
2.	Foron	Sandoz	Switzerland
3.	Palanil	BASF	Germany
4.	Resonil	Bayer	Germany
5.	Samaron	Herchst	Germany
6.	Dispersol	ICI	UK

Commercial Name, Mechanism & Methods of Dyeing with Disperse Dye

(Continued)

Mechanism of disperse dyeing

The dyeing of hydrophobic fibers like polyester fibers with disperse dyes may be considered as a process of dye transfer from liquid solvent (water) to a solid organic solvent (fiber).

The application of heat to the dye liquor increases the energy of dye molecules and accelerates the dyeing of textile fibers.

Heating of dye liquor swells the fiber to some extent and assists the dye to penetrate the fiber polymer system. Thus the dye molecule takes its place in the amorphous regions of the fiber. Once taking place within the fiber polymer system, the dye molecules are held by hydrogen bonds and Van Dar Waals' force.

Commercial Name, Mechanism & Methods of Dyeing with Disperse Dye
(Continued)

Mechanism of disperse dyeing (Continued)

The dyeing is considered to take place in the following simultaneous steps:

Diffusion of dye in solid phase into water by breaking up into individual molecules. This diffusion depends on dispersibility and solubility of dyestuff and is aided by the presence of dispersing agents and increasing temperature.

Adsorption of the dissolved dye from the solution onto the fibre surface. This dyestuff adsorption by fibre surface is influenced by the solubility of the dye in the dye bath and that in the fibre.

Diffusion of the adsorbed dye from the fibre surface into the interior of the fibre substance towards the centre. In normal condition, the adsorption rate is always higher than the diffusion rate. And this is the governing step of dyeing.

Commercial Name, Mechanism & Methods of Dyeing with Disperse Dye
(Continued)

Effect of Various Conditions on Disperse Dyeing

Effect of Temperature:

In case of dyeing with disperse dye, temperature plays an important role. For the swelling of fibre, temperature above 100°C is required if high temperature dyeing method is applied. Again in case of carrier dyeing method, this swelling occurs at 85-90°C. If it is kept for more time, then dye sublimation and loss of fabric strength may occur.

Effect of pH:

For disperse dyeing the dye bath should be acidic and pH should be in between 4.5-5.5. For maintaining this pH, generally acetic acid is usedAt this pH dye exhaustion is satisfactory. During colour development, correct pH should be maintained otherwise fastness will be inferior and colour will be unstable.

Commercial Name, Mechanism & Methods of Dyeing with Disperse Dye
(Continued)

Methods of application of disperse dyes:

Dyeing of Polyester fabric with Disperse dyes.:

- Method N: Normal dyeing method. Dyeing temperature is between 80-100°C.
- Normal NC method: Method of dyeing at normal temperature with carriers. Dyeing temperature is between 80-100°C.
- Method HT: High temperature dyeing method. Dyeing temperature is between 105-140°C.
- Method T: Thermasol dyeing method. Dyeing temperature is between 180-220°C, continuous method of dyeing.
- Pad roll method: Semi continuous dyeing method.
- Pad steam method: Continuous dyeing method.

Commercial Name, Mechanism & Methods of Dyeing with Disperse Dye

(Continued)

Factors Considered for Selection of a Method:

1. Availability of dyeing machine.
2. Required colour effect (dark/medium/light).
3. Required colour fastness.
4. Type of material to be dyed.
5. Cost of dye, chemicals and auxiliaries.
6. Overall economy of the system.
7. Dyeing temperature.


Thank
You!