Lecture-23

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Methods of Dyeing with Disperse Dye

Carrier Method

Procedure:

i) Dye sol is prepared with cold water (1:10) & kept for 15 mins.

ii) Dye bath is set at 60°C & carrier, dispersing agent and salts are mixed one by one.

iii) Material is added and kept for 15 mins without raising temp.

iv) The dye sol is added and p^H is controlled with CH_3COOH

v) The temp is raised up to 100°C. Then dyeing is continued for required time 1 hr.

vi) The temp is lowered to 70°C, then rinsed and reduction clearing if required.

Reduction clearing is done is case of medium and deep shade only to improve the wash fastness

Methods of Dyeing with Disperse Dye (Continued)

Carrier Method (Continued)

Recipe

Dye → x% owf

Carrier → 1-4% owf

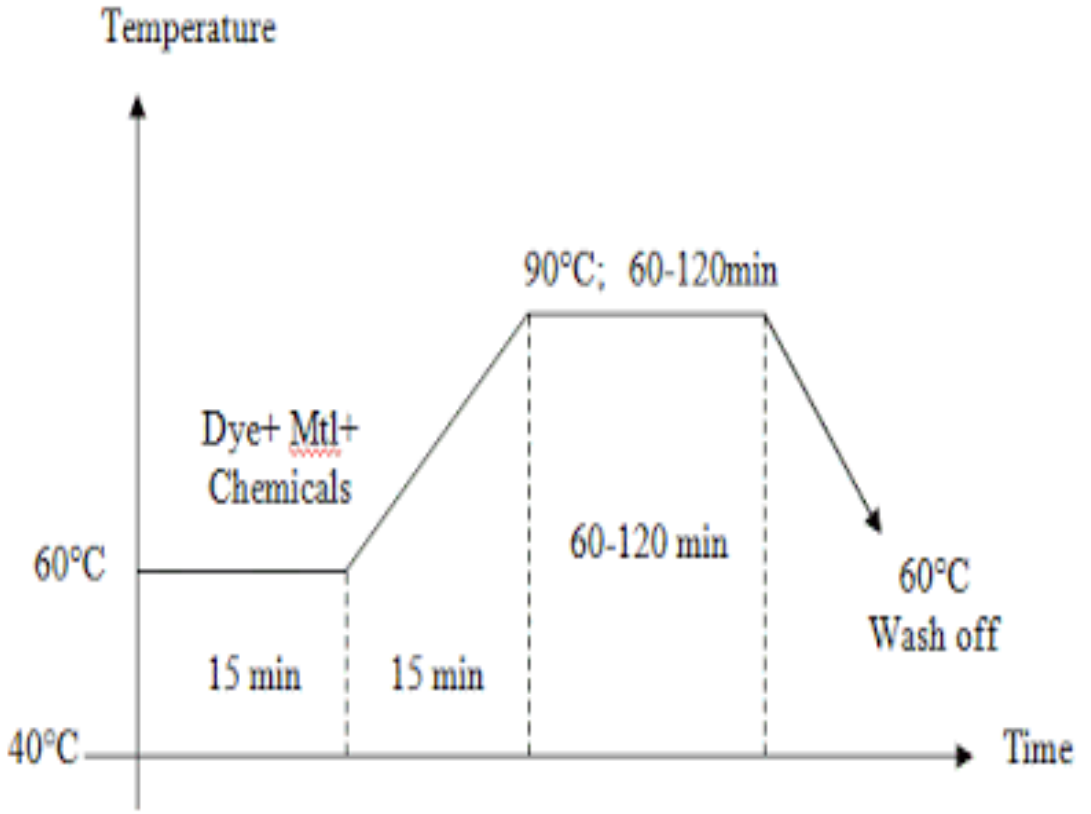
Dispersing agent → 0.5-1%

Acetic acid (P^H 4.5- 5.5) → 1-2g/L

M:L Ratio → 1:10

Temp → 100°C

Time → 1 hr.



Methods of Dyeing with Disperse Dye (Continued)

High Temperature Dyeing Method

Procedure:

i) Dye sol is prepared by adding cold water 1:8 and kept for 15 mins.

ii) Dye bath is set at 60°C and dispersing agent and salt are added.

iii) The mtl is treated for 15 mins without raising temp.

iv) The dye sol is added and P^H is controlled with CH_3COOH

v) The temperature of dye bath is raised up to 130°C with 30 mins.

vi) Dyeing is continued at 130°C for 1 hr.

vii) The dye bath is cooled as early as possible.

viii) The fabric is allowed hot rinsing.

ix) Reduction cleared if required as be fore.

x) The fabric is again rinsed and then dried.

Methods of Dyeing with Disperse Dye (Continued)

High Temperature Dyeing Method (Continued)

Recipe:

Dye → x% owf

Dispersing agent → 0.5-1%

Salt → 0.5-1%

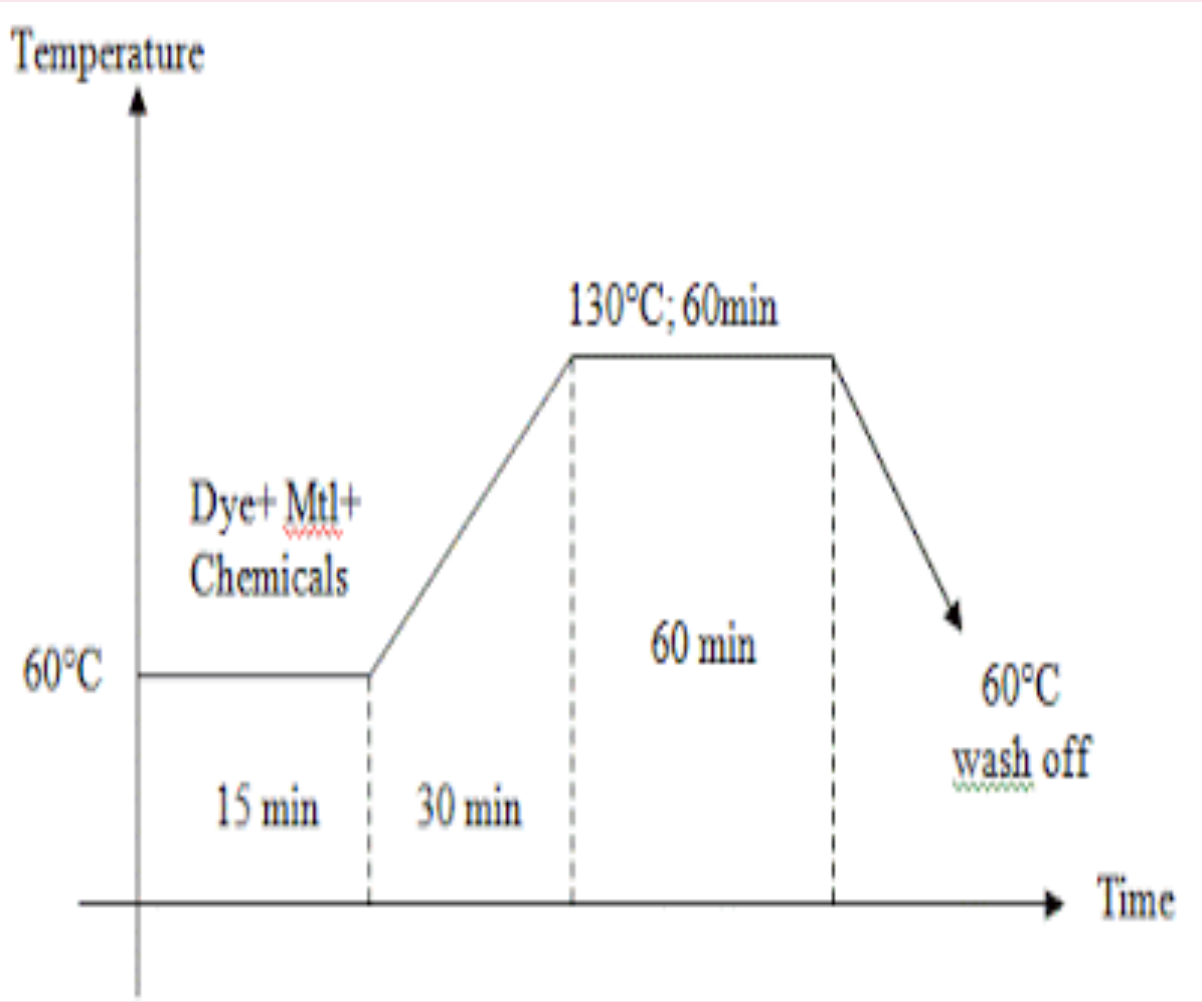
Acetic acid → 0.75-1 g/L

(P^H → 4.5-5.5)

M:L Ratio → 1:8

Temp → 130°C

Time → 1 hr.



Methods of Dyeing with Disperse Dye (Continued)

High Temperature Dyeing Method (Continued)

Advantage of HT Method:

- ✓ Dyeing time are frequently shorter
- ✓ Higher temp require
- ✓ No need of carrier
- ✓ Max^{m} 98% dye fixation
- ✓ Loss of dye is less
- ✓ Light fastness and wet fastness is usually higher
- ✓ Better exhausion and deeper dyeing can be produced.
- ✓ Faster diffusion of the dye in the fiber at elevated temp.

Methods of Dyeing with Disperse Dye (Continued)

Thermosol Dyeing Method

Recipe:

Dye → x% owf

Thickener → 20-40 g/L

Wetting agent → 1-2 g/L

Acetic acid → 1-1.5 g/L

(P^H → 4.5-5)

Time → 2 hr.

Process sequence:

Padding of fabric in a padder

↓

Drying (90°-100°C)

↓

Curing/ Thermo fixing (180-220°C)

↓

Washing.

Mechanism of thermo sol Process: In thermosol process, dye is dissolved in fiber. But dye heat is used instead of aqueous medium. Dye is deposited on fiber surface. When fiber is exposed at dry heat temp (250°C), then dye is directly dissolved in fiber. Complete penetration is occurred at 60s.

Methods of Dyeing with Disperse Dye (Continued)

Thermosol Dyeing Method (Continued)

Dyeing precedure:

i) The fabric is padded with the dye sol using above recipe.

ii) The fabric is dried at 100°C depending on the dryer used.

If dryer temp is too high then solid shade will not be obtained.

iii) Fixation of dyes done at 203°C for 60-90s depending on the type of fiber of the fabric, dye and depth of shade.

iv) The unfixed dyes and chemicals are washed off by warm water.

v) Soap washing or reduction cleared if necessary as be fore

vi) Finally the fabric is washed and then dried.


Thank
You!