**Experiment No.: 08**

**Name of the Experiment:** Dyeing of 100% cotton knitted fabric with direct dye by exhaustion method

**Theory**: Direct Dye is a class of dyestuff that are applied directly to the substrate in a neutral or alkaline bath. They produce full shades on cotton and linen without mordanting and can also be applied to rayon, silk, and wool. Direct dyes give bright shades but exhibit poor wash fastness. Various after treatments are used to improve the wash fastness of direct dyes.  Direct Dyes are molecules that adhere to the fabric molecules without help from other chemicals. Direct dyes are defined as anionic dyes with substantively for cellulosic fibres, normally applied from an aqueous dye bath containing an electrolyte, either sodium chloride (NaCl) or sodium sulphate (Na2SO4).

**Objective:**

* To learn about dyeing process of cotton fabric by direct dye
* To dye cotton fabric with direct dye by exhaustion process
* To write a report according to the experiment

**Apparatus:**

* 1. Beaker
	2. Measuring Cylinder
	3. Pipette
	4. Pot
	5. Tri-pod stand
	6. Gas Burner
	7. Glass rod
	8. Digital Balance
	9. Thermometer
	10. pH meter
	11. Scissor

**Function of the Chemicals**

|  |  |
| --- | --- |
| **Name of chemicals** | **Function** |
| Direct Dye | Coloring Substances to dye the fabric |
| Soda Ash | To maintain pH of the dye bath |
| Wetting Agent | Reduce surface tension for easy penetration of dyes into fabric |
| Sequestering Agent | To remove the water hardness by deactivating metal ions |
| Salt | Used as electrolyte |

**Typical Recipe:**

|  |  |  |  |
| --- | --- | --- | --- |
| **SL** | **Chemicals/Process Parameter** | **Amount of Chemicals** | **Stock Solution%** |
| 1 | Direct Dye |  |  |
| 2 | Wetting Agent |  |  |
| 3 | Sequestering Agent |  |  |
| 4 | Soda Ash |  |  |
| 5 | Salt |  |  |
| 6 | Sample Weight |  |  |
| 7 | M:L |  |  |
| 8 | Temperature |  |  |
| 9 | Time |  |  |
| 10 | pH |  |  |

**Recipe Calculation:**

**Process Flowchart**

Collection of 100% cotton pre-treated sample

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Dyeing with direct dye at 100$℃$ for 20 Minutes

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After Treatment

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Cold rinsing

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Hot wash

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Cold rinsing

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Drying

**Process Curve**

**Sample Attachment**

**Conclusion/Comments:**