Abstract

Reactive dyes come in a wide range of shades and have excellent all-fastness characteristics. Reactive dyes have a very basic structural design. Reactive dyes are widely used in the industry and provide excellent, vibrant colours from a commercial standpoint. Because of their covalent interaction with the -OH group of cellulose fibers, reactive dyes offer excellent wet fastness qualities. The manufacture of reactive dyes uses cyanuric chloride. In the Triazin ring, numerous distinct groups are introduced, and they are subsequently coupled using various couplers. Bifunctional reactive dyes were primarily used in the printing and dyeing industries. The colouring agents utilized in this study were all of chemical grade. Five series of bifunctional reactive dyes and one series of mono chloro reactive dyes were created by a synthetic process. Phenyl Urea derivatives are used as a intermediate and several coupling component such as J- acid, H-acid, Gamma acid were used. For preparation of series five 4-amino-4'-hydroxy chalcone was used, in this series J-acid, N-methyl-J-acid, N-Phenyl-J-acid, Peri acid and K-acid were used as a coupling component. In series six *O*-anisidine was used as diazonium salt and 4-amino-4' amino-hydroxy chalcone intermediates several coupling components such as Gamma acid, J-acid, N-methyl-J-acid, N-Phenyl-J-acid, K-acid and Peri acid were used.

Synthesized dyes were characterized by Thin Layer Chromatography, Ultraviolet (UV) and visible spectroscopy, Infra-Red (IR) Spectra and Nuclear Magnetic Resonance Spectroscopy. Solubility of dyes were also examined.

All series of dyes were applied on Cotton, Silk, and Wool fabric. Exhaustion and fixation study of dyes were examined. The alkali and dyeing temperature employed determine whether reactive dyes are compatible. If the alkali concentration is low, lowering the dyeing temperature to 60 °C produces good results. Several dyeing parameter like effects of salt concentration, effects of pH, effects dyeing time were studied. Cold pad batch method and printing method were also applied for application of dyes on cotton fabric. Exhaustion and Fixation value of all dyes was examined on cotton, wool, and silk fabric. Colorimetric data (L*, a*, b*, C*, H*, K/S) on printed fabric have been studied.

Reactive dyes are expanding quickly because they have strong lightfastness characteristics. Triazin groups that are included in dye structures improve the fastness characteristics of dyes. Synthesized dyes were able to accomplish fastness characteristics like washing, light, and rubbing fastness. High solubility of dyes gives excellent wet fastness properties of dyes. All dyes have maximum solubility at 100 g/l and minimum 55

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g/l are achieved. Antibacterial activity of series no I was also examined. The multifibre staining of different fibers were also evaluated. TGA study of all dyes also evaluated. Stability of reactive dyes were also examined. The stability of reactive dyes also evaluated, at 40 ^{0}C stability of dyes gives good results shows that dye have stability at 40 ^{0}C.