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Preparation of novel dye materials and application with supercritical CO_2 medium: Environmentally and health-friendly system

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In the conventional-water based coloration methods, polymer and textile industries requires more amount of water for the coloration demands and also needs several chemical additives like dispersing agents and surfactants for enhancing the solubility of dye in water. Therefore eco-friendly purposes, related industry looking for environmentally and bio friendly process to replace the conventional-water based application method. In order to overcome, the biological, the ecological and economical disadvantages, super critical fluid dyeing process has been interested and introduced nowadays. In the supercritical fluid system, supercritical fluids were used as dye solvents instead of water. A supercritical fluid can be defined as a substance above its critical temperature (Tc) and pressure (Pc). Under these described conditions the substance has unique properties, in that it exists as a vapor and liquid in equilibrium. Carbon dioxide is particularly attractive due to its green properties like recyclable, non-toxic, biologically friendly and non-flammable advantages. Anthraquinone disperse dye molecules are plays a vital role in the coloration industry. These molecules are more stable under the experimental conditions and as well as in various organic solvents when during the calibrations. Molar absorption coefficients of anthraquinone dyes are allows spectroscopic determination even at very low concentrations. Series of anthraquinone blue dye derivatives have been designed and synthesized from available moieties with simple and convenient methods. Herein, anthraquinone dyes were synthesized, analyzed and fully characterized by ^{1}HNMR, ^{13}CNMR, UV-Vis and HRMS. The UV-Vis spectra of the dyes were indicated that the absorption wavelengths of the dyes were about bathochromic wavelength range, which shows that they were blue dyes. These new developed dyes can be considered as eco-friendly and biological friendly application system.

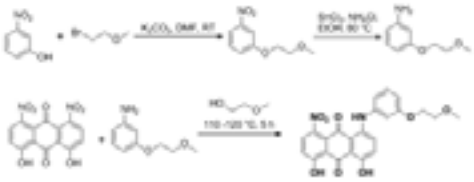

Figure 1. Demands on biologically and environmentally friendly application system

Figure 2. Design and preparation of new dye molecules towards biologically and environmentally friendly application system

Recent Publications

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Biography

Young-A Son is a professor in the Department of Advanced Organic Materials Engineering, Chungnam National University. His current research interests include luminescent organic materials, chemosensors, thermochromic dyes, color filter, functional dye materials and biosensors.

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