

Measurement of Solubility for Disperse in Supercritical Carbon Dioxide by Using a UV-Visible Spectroscopy with Optical Fibers

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Objectives of this study are to develop experimental apparatus and technique for measuring of solubility in supercritical carbon dioxide and to measure and correlate the solubility of dyestuffs in supercritical carbon dioxide. Furthermore, we want to propose criteria of optimum conditions for supercritical fluid dyeing.

Solubility of the dye E-type(C. I. Disperse Yellow 54, C. I. Disperse Blue 56, C. I. Disperse Red 60) and S-type(C. I. Disperse Yellow 114, C. I. Disperse Blue 79.1, C. I. Disperse Red 360) in supercritical carbon dioxide have been measured in the temperature range from (333.15 to 393.15) K and at pressure from (15 to 32) MPa.

Solubility data of the E-type and S-type in supercritical carbon dioxide were correlated in terms of the density (g/cm³) of carbon dioxide using an empirical equation of Bartle et al.

It is experimentally evident that the solubility of non-volatile solid such as disperse dye in supercritical fluid is significantly increased by adding a small amount of co-solvent into the fluid. And organic solvents such as acetone, ethanol were used as co-solvent.