Dyeing of Polyester with Natural and Disperse Dyes in Supercritical Carbon Dioxide

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Waterless dyeing is the new approach in textile dyeing in order to reduce or eliminate effluents and supercritical carbon dioxide (scCO2) is an alternative solvent being considered. Since it is low in cost, non-toxic, non-flammable and its low critical parameters (31.3ºC, 73.8 bar). It can also be recycled from a process. The research focus has therefore been on dyeing of polyester with a synthetic and natural dyes in supercritical CO2 at 100 °C and 250 bar. The dyeing of polyester with a disperse and the selected natural (turmeric root and walnut leaves extracts) dyes in aqueous solutions is also carried out to compare the quality of dyeing in scCO2. The color yields of fibres were assessed by K/S measurements before and after washing to investigate the quality of dyeing in this medium. The best color yield results for polyester had been obtained with disperse dye but the promising result was obtained for turmeric extract. Therefore, a dyeing method from non-aqueous medium without causing environmental problems, using less chemical and additives can be applied to contribute green chemistry.

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