



RECYCLE OF POLYAMIDE DYEING WASTEWATER FOLLOWING DECOLORIZATION WITH POLYMERIC SORBENTS

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Abstract

The objective of this work is to evaluate the feasibility of adsorption decolorization and recycling of polyamide acid dyeing baths in order to develop an in-plant decolorization system leading to water conservation and wastewater minimization.

The color of the wastewater produced in the dyeing process of polyamide at two dye concentrations and in the rinsing phase has been removed by sorption. Two acid dyes from the same commercial range (Bezanyl) have been tested, both used without previous purification. Synthetic wastewater of known chemical composition has been used. The adsorbent that has been used is an acrylic weak base anion exchange resin with ethylenediamine functional groups, selected from several anion exchange resins. The color removal degree, expressed in percentage, was calculated from the relative decrease of absorbance. It was found that color removal is more efficient at 50 °C, especially for the green dye. The presence of the electrolyte favours the sorption, in what concerns both efficiency and duration of the process.

Afterwards, bleached polyamide fabric was dyed with the two dyes, and the wastewater has been treated and recycled in scouring processes, as it is or mixed with fresh water (1:1). The color parameters, the color difference and the degree of whiteness of the polyamide samples scoured with recycled water were measured.

The results of this study demonstrate that recycling of in-plant decolorized wastewaters from acid dyeing in new preparation stages is feasible, especially for low concentration dyeing, and has the potential to not only decrease wastewater volume and treatment cost, but also minimize water use as well as the discharge of textile pollutants such as salt and dyes.

Key words: adsorption, decolorization, polyamide dyeing, wastewater recycle

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