Continuous reuse of water and electrolyte from decolorized reactive dyebaths

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ABSTRACT

In this work, the feasibility of reusing water and salt from reactive dyebaths after electrochemical decolourization was evaluated. Dyeing series of ten reuses with three reactive dyes (Navy Blue Procion H-EXL, Crimson Procion H-EXL and Yellow Procion H-EXL) were carried out (individually and in a trichromie) and color differences and total organic carbon values were measured to study how the successive reuses affect the quality dyeing. The first reuse produced dyeings with low colour differences with respect to a standard dyeing. In the subsequent reuses, colour differences increased until they reached a constant value at the 4th or 5th reuse, following a similar behavior to the organic matter content. At this point, it is determined the percentage of dye increase that allows for continuous dyeing of acceptable quality for the textile industry. To obtain dyeings with acceptable color differences (\( \text{DE}^* \leq 1 \)) independent of the number of consecutive reuses, a 30% increase in blue dyestuff and 10% for red dyestuff must be added, whereas in the case of yellow dyeing, it was not necessary to increase the dye amount after subsequent reuses. In each dyeing, this process allowed savings of 70% of water and an average of 60% for salt.

Keywords: Electrochemical treatment; Reactive dyebaths; Continuous reuse; Salt recovery; Color differences

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