

IONIC-LIQUID-BASED AQUEOUS TWO-PHASE SYSTEMS FOR THE EXTRACTION OF DYES

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Abstract:

Dyes are used in different industries for coloring purposes. However, a large amount of the dyes is not used nor recovered at the end of the processes. The textile industry is one of the main industries which discharges a heavy load of chemicals used during the textile processing. As a result, the release of large contents of dyes for the aqueous effluents leads to both environmental and economic concerns. Indeed, the extensive use of dyes guides to further problems in human health and in the ecosystem. Most of the dyes are carcinogenic, mutagenic, allergenic and toxic by nature. Therefore, new environmental laws are being implemented, and the removal of textile dyes from waste water streams has been a subject of great interest in the past few years.

As a novel approach to remove dyes from aqueous effluents, in this work, ionic-liquid-based aqueous two-phase systems (ATPS) were investigated. These ATPS are composed of several ionic liquids (ILs) and distinct inorganic salts to evaluate the influences of the ionic liquid structural features, the nature and salting-out ability of the salt employed, and of the pH of the aqueous medium. The extraction efficiencies of the dyes using different ATPS were determined by experimental measurements on their partition coefficients. A proper selection of the ionic liquid and of the inorganic salt is shown to lead to complete extractions in a single-step procedure.