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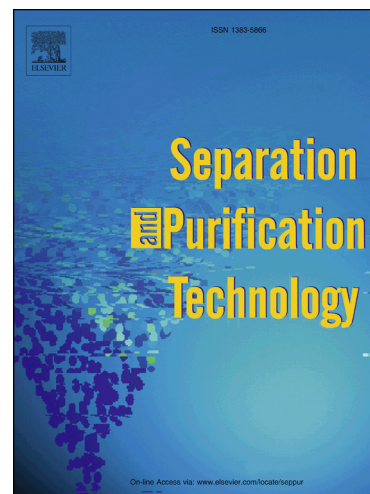
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A novel strategy for the removal of rhodamine B (RhB) dye from wastewater by coal-based carbon membranes coupled with the electric field

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Abstract: A novel strategy is proposed to treat rhodamine B (RhB) wastewater by integrating the coal-based carbon membrane with an electric field. The effects of various parameters including electric field intensity, RhB concentration, and solution pH on separation performance of the treatment system are investigated. The degradation intermediates of RhB are detected by high-performance liquid chromatography/mass spectrometry (HPLC/MS). The results show the introduction of the electric field is found to be quite effective in enhancing the permeability and removal efficiency due to electrochemical oxidation. Under acidic condition, the treatment system possesses good fouling resistance to RhB molecules, and demonstrates high permeability and removal efficiency. High RhB concentration (>100 ppm) usually increases the load of the treatment system, resulting in low permeability and removal efficiency due to insufficient degradation ability. N-de-ethylated intermediates and organic acids are identified during the degradation process. Based on this result, the possible degradation pathways of RhB in the treatment system are proposed.

Keywords: Carbon Membrane; Electric Field; Rhodamine B; Electrochemical degradation

1. Introduction

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