

## Preparation and characterization of magnetic polysulfone/thiourea microcapsules and their application for Cr(III) removal

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Received 27 May 2016; Accepted 6 November 2016

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### ABSTRACT

In this study, novel magnetic polysulfone microcapsules based on N-Benzoyl-N'-(4-methylphenyl) thiourea (TTU) were prepared with the phase inversion method. Characterization of the microcapsules was performed by using scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDX), and thermogravimetric analysis (TGA) techniques. The investigation of the adsorption properties of prepared microcapsules for the Cr(III) ion in the aqueous solution were evaluated. The parameters affecting the adsorption such as pH, contact time, amount of adsorbents (microcapsules), temperature and concentration were examined. Langmuir and Freundlich adsorption isotherms were studied to investigate the suitability of adsorption mechanism. The adsorption behavior of Cr(III) ions was found to be appropriate for the Langmuir isotherm. Cr(III) ion adsorption is spontaneous and exothermic and the adsorption process is more suitable to pseudo second order kinetic model according to the thermodynamic and kinetic analysis of the experimental data. Besides, real wastewater sample was used in order to highlight the effects of background water chemistry. Tannery wastewater was used for the removal of Cr(III) ions. Cr(III) ions were effectively removed by 87.54%.

*Keywords:* Adsorption; Cr(III); Microcapsule; N-Benzoyl-N'-(4-methylphenyl) thiourea; Polysulfone

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