

Structural and Ion Exchange Studies of Terpolymer Resin Derived from 4, 4'-Biphenol-4,4'-Oxydianiline-Formaldehyde

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Abstract : A novel terpolymer resin has been synthesized by condensation polymerization reaction of 4,4'-biphenol and 4,4'-oxydianiline with formaldehyde in presence of 2M hydrochloric acid as catalyst. Composition of resin was determined on the basis of their elemental analysis and further characterized by UV-Visible, infra-red and nuclear magnetic resonance spectroscopy to confine the most probable structure of synthesized terpolymer. Newly synthesized terpolymer was proved to be a selective chelating ion-exchanger for certain metal ions and were studied for Fe³⁺, Cu²⁺, Ni²⁺, Co²⁺, Zn²⁺, Cd²⁺, Hg²⁺ and Pb²⁺ ions using their metal nitrate solutions. A batch equilibrium method was employed to study the selectivity of metal ions uptake involving the measurements of the distribution of a given metal ion between the terpolymer sample and a solution containing the metal ion. The study was carried out over a wide pH range, shaking time and in media of different electrolytes at different ionic strengths. Distribution ratios of metal ions were found to be increased by rising pH of the solutions. Hence, it can be used to recover certain metal ions from waste water for the purpose of purification of water and removal of iron from boiler water.

Keywords : terpolymers, ion-exchangers, distribution ratio, metal ion uptake

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