

Synthesis and Characterization of Copolymer Derived from 2-Amino 6-Nitrobenzothiazole, Biuret and Formaldehyde and Their study as Ion Exchange Resin for Toxic Cationic Elements

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Abstract: The condensation of 2-amino 6-nitrobenzothiazole and biuret with formaldehyde at molar ratios of 1:1:2 of the reacting monomers within the sight HCl as a catalyst yielded a copolymer as an ion exchange resin. Electronic spectra, FTIR spectra, and ¹H NMR spectra were used to analyze the resin. The batch equilibrium method was used to investigate the ion-exchange characteristics of this resin for Cu²⁺, Ni²⁺, Zn²⁺, Co²⁺, and Pb²⁺ ions throughout a pH range of 2.0 to 6.0 and in fluids of varying ionic strengths. In the following order, the resin polymer demonstrated a better choosiness for removing these ions Pb²⁺ > Cu²⁺ > Ni²⁺. The quantity of metal ion in use up by resin rises as the pH of the medium rises, according to analysis ratio of distribution as a function of pH. Scanning electron microscopy was used to analyze the surface morphology of the copolymer resin, which revealed the intermediate state among crystalline and amorphous nature. This research could be used to treat industrial waste water.

Keywords: Copolymer; Resin; Polycondensation; Ion-exchanger; Heavy elements; Metal ion uptake; Distribution ratio.

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