

Synthesis of azobenzene-based ion-imprinted polymers for selective removal of cobalt and copper ions from a mixture of metal ions

ABSTRACT

Azobenzene based metal ion-imprinted polymers (IIPs) were synthesized for selective separation of Co (II) and Cu (II) ions from the mixture of metal ions. After polymerization, cavities for the Co²⁺ and Cu²⁺ ions were created in the polymer materials by leaching with hydrochloric acid solution. The synthesized IIPs were characterized by FT-IR, ¹H NMR and elemental analysis. The competitive sorption studies were carried out to evaluate the selectivity of the target metal ions. Interestingly, the observed sorption capacity was pH dependent and maximum sorption was found to be 95.4 and 103.0 mg·g⁻¹ for Co-IIPs and Cu-IIPs at pH 5, respectively. It was observed that the IIPs showed good selectivity to Co (II) and Cu (II) ions in the presence of other bi and trivalent metal ions in solution. Reused capacity was also checked for six times without a significant decrease in binding affinity for IIPs.