

ABSTRACT

Zn(II) ION-IMPRINTED POLYMER AND ITS ANALYTICAL APPLICATION

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The goal of this study is to synthesize a new Zn(II) ion-imprinted polymeric sorbent and to investigate the use of this synthesized polymeric sorbent for selective Zn(II) ion adsorption in aqueous medium. In the ion imprinting method, the selectivity of the polymeric adsorbent depends on the coordination number, coordination geometry, charge and size of ions.

In this study, zinc methacrylate was used as the source of zinc ion and *n*-vinylcarbazole (NVC) was used as the ligand monomer. NVC acts both as the monomer by participating in the reaction via the opening of double bond in vinyl group during polymerization process and as the ligand by forming a complex with the zinc ion. Azobisisobutyronitrile (AIBN) was used as the initiator and ethylene glycol dimethacrylate (EGDMA) was used as the cross-linker in polymerization. The polymer which was obtained from the thermally initiated reaction has been ground, sieved and the particles within the range of 50-100 μm have been used throughout the experimental study. The template zinc ion was removed from these particles by acid extraction and then zinc ion-imprinted polymer (Zn-IIP) was obtained. Afterwards, the selective adsorption of the same metal ion into the cavities which were formed after removal of zinc ion has been tested. Non-imprinted control polymer was synthesized using the same procedure without the template Zn(II) ion and has been used in the adsorption experiments as well.

Maximum adsorption capacity of ion-imprinted polymeric material was calculated as 8.29 mg/g, whereas maximum adsorption capacity of non-imprinted control polymer was 6.40 mg/g.

Keywords: Ion imprinting, metal ion-imprinted polymer, determination of zinc, *n*-vinyl carbazole.