



Synthesis, characterization and analytical applications of N-dodecyl pyridinium chloride-cerium (IV) phosphate fibrous ion exchanger: selective for Hg(II) and its binary separations

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ABSTRACT

An intercalated hybrid fibrous ion exchanger has been synthesized by incorporating N-dodecyl pyridinium chloride with the inorganic cation exchanger, cerium (IV) phosphate. The synthesized, N-dodecyl pyridinium chloride-cerium (IV) phosphate (DPC-CeP) cation exchanger was characterized using X-ray diffraction studies, SEM, thermogravimetric (and differential thermogravimetric) analysis and elemental analysis. The ion-exchange characteristics (ion-exchange capacity, elution and concentration behaviour) and thermal stability were also determined by usual chemical method. The adsorption studies for alkaline earths and heavy metal ions on the synthesized material were also performed in different acidic media. DPC-CeP has been found to be selective for Hg(II) ions. Hence, some binary separations of Hg(II) ions from the mixture containing other metal ions have been carried out on its column, exploring the potential role of the synthesized material in environmental studies and water treatment.

Keywords: Intercalated fibrous ion exchanger; Cerium (IV) phosphate; N-dodecyl pyridinium chloride; Adsorption; Hg-selective; Environmental studies

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