



Application of zirconium phosphonate—a novel hybrid material as an ion exchanger

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ABSTRACT

In the present endeavour, zirconium amino tris(methylenephosphonic acid) (ZrATMP)—a novel hybrid ion exchange material of the class of tetravalent metal acid (TMA) salts has been synthesized by sol gel method. Physico-chemical and instrumental methods of analysis [Elemental analysis (ICP-AES, CHN analysis), FTIR, TGA, XRD and SEM] have been used to characterize the material. Cation exchange capacity (CEC) has been determined and the distribution behaviour of metal ions Co^{2+} , Ni^{2+} , Cu^{2+} , Zn^{2+} , Cd^{2+} , Hg^{2+} , Pb^{2+} , Ce^{3+} and Th^{4+} in aqueous and various electrolyte media/concentrations determined and confirmed with breakthrough capacity values.

Keywords: Tetravalent metal acid salt; metal phosphonate; zirconium phosphonate; hybrid ion exchanger; cation exchanger; metal aminophosphonate

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