

Recovery of indium from ITO solutions by bifunctional poly(vinyl phosphonic acid-co-glycidyl methacrylate-co-divinyl benzene) cation exchange resin

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Poly(vinyl phosphonic acid-co-glycidyl methacrylate-co-divinyl benzene) (IPVGD) and poly(vinyl phosphonic acid-co-glycidyl methacrylate-co-divinyl benzene) (PVGD) were synthesized by suspension polymerization, and their indium adsorption properties were investigated. The synthesized IPVGD and PVGD resins were characterized by scanning electron microscopy (SEM), energy-dispersive X-ray spectroscopy(EDS), Fourier transform infrared (FT-IR) spectroscopy and mercury porosimeter. The water uptake ion-exchange capacity and their indium adsorption properties were investigated. The optimum indium adsorption from pure indium solution and artificial ITO solution by PVGD and IPVGD cation exchange resins were 2.3, 3.5 meq/g. The maximum adsorption predicted by the Langmuir adsorption isotherm model was greatest at a 0.5 molar ratio of VPA.