

**Liquid-liquid extraction of some lanthanide metal ions by polyoxyalkylene systems.**

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**Abstract**

Polyoxyalkylene systems, namely, polypropylene glycol (PPG-1025), polyethylene glycol (PEG-600) and polybutadiene oxide (PBDO-700) dissolved in either nitrobenzene or 1,2-dichloroethane were tested as prospective extractants for some lanthanide metal ions ( $\text{Eu}^{3+}$ ,  $\text{Pr}^{3+}$  and  $\text{Er}^{3+}$ ) from their aq. solns. in the presence of picrate anions. The metal ions were quantified before and after extn. using the inductively coupled plasma emission spectrophotometry technique. The percent extn. and the distribution coeffs. indicated that pH of the aq. phase, picrate concn. and the org. solvent are the major parameters that affect the extn. efficiency of the metal ions. The optimum pH range is 3.5-5.5 and the picrate concn. should be as high as possible; however, a picrate concn. of .apprx.0.05 M proved to be adequate for a near quant. extn. In all cases, nitrobenzene enhanced a higher percent extn. compared to 1,2-dichloroethane. The efficiency of the polyoxyalkylene systems to ext. certain lanthanide metal ions was in the order PBDO-700 > PPG-1025 > PEG-600 when 1,2-dichloroethane used as the solvent in the org. phase. The extractability of PPG-1025 towards the lanthanide metal ions was in the order  $\text{Pr}^{3+}$  >  $\text{Eu}^{3+}$  >  $\text{Er}^{3+}$  irresp. of the org. solvent used. The stoichiometry of the extd. polyoxyalkylene ion-pairs with the lanthanide metal ions was estd. Each mole of metal ions is assocd. with three moles of picrate anions and 13 to 14 mol of propyleneoxide units in the case of PPG-1025, and .apprx.9 to 10 mol of ethyleneoxide units in the case of PEG-600 and 10 mol of butadiene oxide units in the case of PBDO-700.