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Membrane extraction of metal ions by aminophosphoryl reagents in the active transport conditions

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Abstract

The process of membrane extraction of rare earth ions, Nd(III), Sc(III), and Sm(III), and also the accompanying them in the natural raw material ions Al(III) and Mg(II), by N,N-bis(dihexylphosphorylmethyl)octylamine (BPA) was investigated under the conditions of active membrane transport, and its high efficiency and selectivity was demonstrated with respect to the two first rare earth metals. The influence of principal parameters of the three-phase extraction process, including the nitrate ion concentration, the releasing aqueous phase acidity, the extracting agent concentration in the membrane, and the nature of the membrane solvent, on the membrane permeability, characterizing the efficiency and selectivity of membrane transporters, was established. Comparison of the membrane permeability in the process of transmembrane transport of Nd(III) and Sc(III) with BPA and monophosphorylated amines showed a significant advantage of the biphosphorylated amine extractant. © 2013 Pleiades Publishing, Ltd.

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