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EFFECT OF pH IN THE SYNTHESIS OF ORGANO-CLAYS FOR RARE EARTHS REMOVAL

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Abstract

Two montmorillonitic clays were modified with N-(methoxy-polyethylene glycol) ethylene diamine and tested as sorbents for removal of Rare Earths (REs) from aqueous solutions. Lanthanum was chosen as representing element of REs family and adsorption tests were performed with the aim of selecting a system with good uptake efficiency for the pollutant abatement in wastewaters. The effects of pH were studied and the properties of the obtained final materials were evaluated with simple model systems of the final application. The modified clays were characterized before and after the intercalation, combining the results of X-ray diffraction (XRD) and Fourier Transform Infrared Spectroscopy (FT-IR), whereas the solutions were analysed by means of Chemical Oxygen Demand to quantify the amount of intercalated polymer and by Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES) to quantify the metal ions concentration. The results showed that the organo-clays have been efficiently prepared while the characterization techniques showed that the intercalation mechanism was strongly dependent on the pH of the preparation procedure, affecting the protonation of the amino groups.

Key words: environmental remediation, FT-IR spectroscopy, organo-clays, rare earths removal

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