COMPLEXES OF LANTHANIDES WITH FATTY ACIDS

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The present study describes synthesis of Eu^{3+}, Nd^{3+}, Dy^{3+}, Tb^{3+} and Yb^{3+} behenates using a simple metodology resulting on high purity products. The compounds were analyzed using IR-Spectroscopy, TG-DTG, DSC, %C, %H, XRD, luminescence and SEM. The results show the purity of the compounds and, one of the bands of the IR, the XRD analysis and the SEM images, show the high cristalinity of all complexes. TG-DTG and DSC analyses do not show liquid crystal behavior, agreeing with the initial hypothesis. The mass losses until 1000 °C show that the compounds lose ligand fragments at specific temperatures. XRD of the residues are compatible with the respective lanthanide oxides. The luminescence analysis shows that the Eu^{3+}, Nd^{3+} and Tb^{3+} complexes have an appreciable emission. The Judd-Ofelt parameters obtained are compatible with the values found in the literature. It was not possible to obtain the complexes in a glass-form because it is difficult to prevent the crystallization of the complexes even with the use of liquid nitrogen. The XDR data indicate that one of the complexes axis has 52 Å of length, agreeing with a structure containing a behenate-lanthanide ion-behenate. The structures of the complexes were not fully elucidated and more analyses are necessary. All complexes presented a molar ratio of 3:1 (L:M).

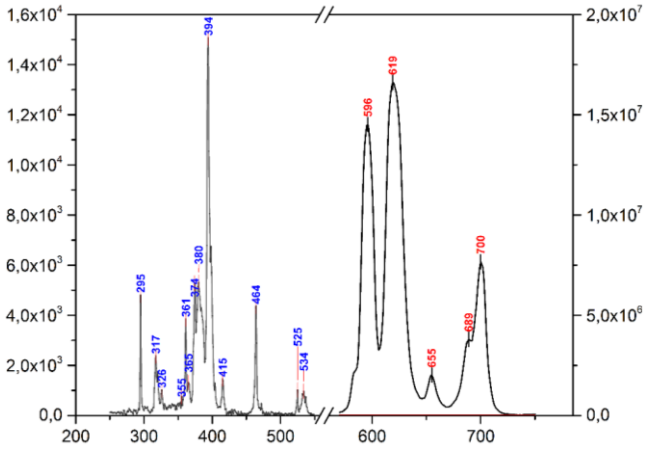

Figure 1 – Excitation (blue numbers) and emission (red numbers) spectra of europium behenate.

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