GREEN LUMINESCENCE SYSTEM CONTAINING THE Tb^{3+}-β-DIKETONATE COMPLEX DOPED IN THE EPOXY RESIN AS EMITTER CENTER

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Optical properties of the terbium tri(acetylacetonate) tetrahydrated, $[Tb(ACAC)_3(H_2O)_4]$, doped in the epoxy resin, i the solid state are reported. The polymeric-Tb^{3+}-complex and the precursor compound were characterized by elementa analysis, thermogravimetry (TG), differential scanning calorimetry (DSC), infrared and electronic spectroscopy. Due t efficient energy transfer from the polymer and ACAC to the rare earth ion, the polymer phosphorescence intensit decreases with the increasing of the Tb^{3+} ion concentration. The luminescence spectra present narrow bands characteristi from the intraconfigurational transitions: a) emission data $^5D_4 \rightarrow {}^7F_J$ (J = 6, 5, 4, 3, 2, 1, 0) and b) excitation data $^7F_6 \rightarrow {}^5L$ (350 nm), $^7F_6 \rightarrow {}^5L_{10}$ (369 nm), $^7F_6 \rightarrow {}^5G_6$ (376 nm), $^7F_6 \rightarrow {}^5D_3$ (380 nm), $^7F_6 \rightarrow {}^5D_4$ (488 nm). The emission arising from th emitting $^5D_3$ level was not recorded indicating that a rapid $^5D_3 \rightarrow {}^7F_4$ radiationless transition is induced by the hig vibrational frequencies of the organic ligand. High lifetime measurement (τ = 0.81 ms) typical of terbium ion suggests tha the polymeric system has higher luminescence efficiency than in the Tb^{3+}-hydrated compound. The concentratio quenching of luminescence was verified in the polymer:[Tb(ACAC)$_3$]15% system. The [Tb(ACAC)$_3$] complex doped int epoxy resin shows high green luminescence intensity.

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9983

PC -36

TRACE AMOUNTS OF RARE EARTH ELEMENTS IN HIGH PURE GADOLINIUM OXIDE BY SECTOR FIELD INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY (SF ICP-MS)

9964

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In recent years rare earth elements have received much attention in the fields of geochemistry and industr Gadolinium oxide is used for many different high technology applications such as infrared absorbing automotive gla petroleum cracking catalyst, gadolinium-yttrium garnets, used in microwave applications, and color TV tube phosphors. can also be used in optical glass manufacturing and in the electronic industry. Rapid and accurate determinations of t REE are increasingly required as industrial demands expand. In general, the inductively coupled plasma mass spectromet presents some advantages for trace element analysis, due to high sensitivity and resolution, when compared with oth analytical techniques. I this work, sector field inductively coupled plasma mass spectrometry (HR ICP-MS) was use Sixteen elements (Sc, Y and 14 lanthanides) were determined selectively with the HR ICP-MS system using concentration gradient method. The detection limits with the HR ICP-MS system were about 0.2 to 8 pg.mL^{-1}. T recovery percentage ranged from 95 to 100% for different rare earth elements. The %RSD of the methods varying betwe 1.5 and 2.5 % for a set of five (n=5) replicates was found for the IPEN's material and for the certificate reference samp Determination of trace REEs in two high pure gadolinium oxides samples (IPEN and JMC) were performed. IPEN material are highly pure (>99.99%) and were successfully analyzed without spectral interference.

Keywords: Rare Earths Elements, Inductively Coupled Plasma Mass Spectrometry, Gadolinium oxide.