Preparation of nanocrystalline Lu_2O_3:Eu phosphor via a molten salts route.

Autorzy

Joanna Trojan-Piegza

Eugeniusz Zych

Rok wydania

2004

Czasopismo

Journal of Alloys and Compounds

Numer woluminu

380

Strony

118-122

DOI

10.1016/j.jallcom.2004.03.037

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

The paper reports on the course of decomposition of hydrated lutetium nitrate and lutetium chloride to Lu_2O_3 in the eutectic mixture of $NaNO_2$ and KNO_2. It was shown that a crystallographically pure phase of the cubic Lu_2O_3 is formed at temperature as low as 250 °C. IR spectra revealed that the recovered powder contains some OH-contamination, however. The powders are characterized by crystallites sizes in the range of 18–30 nm in average. Emission and excitation spectra of Eu-doped powders show characteristic features for Eu^{3+} ion in an oxide host, which indicates that the procedure is appropriate for making activated nanoparticulate oxide phosphors. Most profound emission appears around 611 nm and the luminescence from the powder made starting with $Lu(NO_3)_3$ was noticeably higher compared to the product obtained from $LuCl_3$. The excitation spectrum of Eu^{3+} emission at 611 nm contains a band related to the fundamental absorption of the lutetia host lattice, which indicates an existence of the host-to-activator energy transfer.

Słowa kluczowe

Lu2O3, Chemical synthesis, Molten salts synthesis, Nanostructured phosphors

Adres publiczny

https://doi.org/10.1016/j.jallcom.2004.03.037

Strona internetowa wydawcy

http://www.elsevier.com