Luminescent properties of ytterbium-doped ternary lanthanum chloride.

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Rok wydania

2011

Czasopismo

Journal of Alloys and Compounds

Numer woluminu

509

Strony

7993-7997

DOI

10.1016/j.jallcom.2011.05.062

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Studies of the absorption and temperature dependence of photoluminescence spectra and luminescence decay times of the intra-shell *f–f* transitions ($^2F_{5/2} \leftrightarrow {}^2F_{7/2}$) of Yb^{3+} ions in $K_2LaCl_5:Yb^{3+}$ powders with 5, 10, 15 and 25% of ytterbium are presented. The spectroscopic properties of the powders with different ytterbium content are compared. Experiments were performed at the temperatures from 25 to 300 K. The strong emission around 982 nm has been observed under direct excitation of the luminescence center with 960 nm line of continuous wave Ti:sapphire laser pumped by Ar-ion laser. The temperature quenching effect of the luminescence was rather week, especially in the samples with higher concentration of ytterbium (15 and 25%). Additionally the probability of the *f–f* radiative transitions of the Yb^{3+} ions in these powders was almost temperature independent for more heavily doped samples (with 15 and 25% of Yb) and only weakly temperature dependent for less doped samples (with 5 and 10% of Yb). These results reveal high thermal stability of the optical properties of the examined powders.

Słowa kluczowe

Rare earth alloys and compounds, Chemical synthesis, Optical properties, Kinetics, luminescence

Adres publiczny

https://doi.org/10.1016/j.jallcom.2011.05.062

Strona internetowa wydawcy

http://www.elsevier.com