Persistent luminescence from $Y_3Al_2Ga_3O_{12}$ doped with Ce^{3+} and Cr^{3+} after X-ray and blue light irradiation.

Autorzy

Vitalii Boiko

Justyna Zeler

Marta Markowska

Zhengfa Dai

Aleksandra Gerus

Paulina Bolek

Eugeniusz Zych

Dariusz Hreniak

Rok wydania

2019

Czasopismo

Journal of Rare Earths

Numer woluminu

37

Strony

1200-1205

DOI

10.1016/j.jre.2019.03.010

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

The persistent luminescence (PersL) dependence on the dopants and derived mechanism of trapping and de-trapping processes were investigated in $Y_3Al_2Ga_3O_{12}$ (YAGG) based nanophosphor, doped with Ce^{3+} and/or Cr^{3+}. It is found that the presence of Cr^{3+} ions produce electron and hole traps and capture suitable charge after X-ray irradiation. The effect of irradiation on the carriers trapping and their pathways after excitation was studied by means of thermo luminescence technique. On the other hand, for blue light irradiation the mechanism seems to be different. In the latter case, the Ce^{3+} ions, having the position of energy levels in the conduction band, become sensitizers for the electrons and main emission centres for the PersL (de-trapping process goes through Ce^{3+}).

Słowa kluczowe

Persistent luminescence, Thermoluminescence, YAGG nanophosphors, lanthanides, X-ray, Blue-light irradiation

Adres publiczny

http://dx.doi.org/10.1016/j.jre.2019.03.010

Strona internetowa wydawcy

http://www.elsevier.com