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Luminescence properties of the (A₂B₂O₇) type Eu_{1.90}Dy_{0.10}Ge₂O₇

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Germanates constitute a group of ternary oxides with several properties of interest in the fields of sensing, optical and electro-optical applications and others. The Eu_{2-x}Dy_xGe₂O₇ (x: 0.10) was synthesized via high temperature solid state reaction method under open atmosphere. The reaction conditions and phase forming process were investigated by thermo gravimetry and differential thermal analysis (TG/DTA). The x-ray diffraction (XRD) analysis was carried out to get phase properties of the powder sample. The luminescence properties of the Eu_{1.90}Dy_{0.10}Ge₂O₇ phosphor were determined by a photoluminescence spectrometer (Figure 1) under room temperature. The photoluminescence (PL) results showed that the excitation under ultraviolet region (395 nm) gave different intense emissions in the red region. The emission bands at 589, 611, 645 and 697 nm concern the typical ⁵D₀ → ⁷F₁, ⁵D₀ → ⁷F₂, ⁵D₀ → ⁷F₃ and ⁵D₀ → ⁷F₄ transitions of the Eu³⁺ ions, respectively. The most intense emission peak, 611 nm, belongs to red region transition of Eu³⁺ ions.

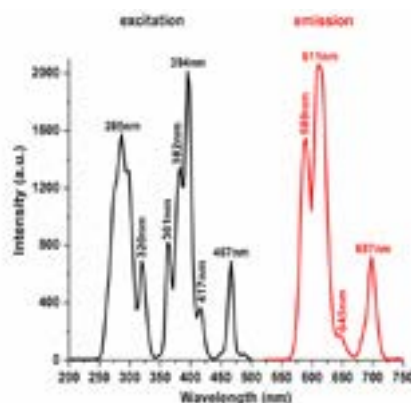


Figure 1. The excitation and emission spectrum of Eu_{1.90}Dy_{0.10}Ge₂O₇ phosphor

Biography

Esra Öztürk has completed her PhD from Erciyes University. She is currently working in the Department of Materials Science and Engineering at Karamanoglu Mehmetbey University. Her research areas are inorganic solid state materials, luminescent materials and piezoelectric smart materials. She has published 20 papers in reputed journals. This work was supported by HYPERLINK "<http://www.tubitak.gov.tr/en/>" to "Home" The Scientific and Technological Research Council of Turkey (TUBITAK) under project number 114Z438.

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