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EFFECT OF HEATING RATE ON THERMOLUMINESCENCE OF LA-DOPED ZINC BORATE

Mustafa Topaksu¹, Nil Kucuk², Mehmet Yüksel¹, Tamer Dogan³

1 Cukurova University, Faculty of Arts and Science, Physics Department, Adana, Turkey

2 Uludag University, Arts-Sciences Faculty, Physics Department, Bursa, Turkey

3 Cukurova University, Vocational School of Imamoglu, Department of Computer Technologies, Adana, Turkey

In this study, the effect of various heating rate (VHR) method on thermoluminescence (TL) characteristics of 1% La-doped ZnB_2O_4 phosphor (i.e. $ZnB_2O_4:0.01La$) was investigated. For this purpose, thermoluminescent material of $ZnB_2O_4:0.01La$ was synthesized by nitric acid method. All TL measurements were made on using an automated Risø TL/OSL DA-20 reader and the sample was irradiated dose of 1 Gy with $^{90}Sr/^{90}Y$ beta source, which has 2.7 MeV energies of electron particles and 40 mCi activity. TL glow curves were recorded from room temperature (RT) to 450 °C in nitrogen atmosphere with different heating rate values from 1 °C/s to 10 °C/s. It was observed that total area and peak intensities of all glow peaks decrease and peak temperature shifts to higher temperature side with increasing heating rate. Furthermore, kinetic parameters of the TL glow peaks of $ZnB_2O_4:0.01La$ phosphor were determined by the VHR method.

Keywords: Thermoluminescence, zinc borate, heating rate, glow curve