

**PHYSICAL AND STRUCTURAL PROPERTIES OF DYSPROSIUM  
DOPED BARIUM BORATE GLASS**

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## ABSTRACT

### PHYSICAL AND STRUCTURAL PROPERTIES OF DYSPROSIUM DOPED BARIUM BORATE GLASS

Six different glass samples have been prepared in this project by melt-quenching technique with composition  $(81-x)\text{H}_3\text{BO}_3-19\text{BaCO}_3-x\text{Dy}_2\text{O}_3$ , where  $x = 0.0, 0.2, 0.4, 0.6, 0.8,$  and  $1.0$  mol%. By varying the proportion of  $\text{H}_3\text{BO}_3$  and  $\text{Dy}_2\text{O}_3$ , the effect of  $\text{Dy}_2\text{O}_3$  to the barium borate glass can be investigated in terms of physical properties such as density and molar volume. The structural properties were measured by X-Ray Diffraction (XRD) technique and Fourier Transform Infrared (FTIR) spectroscopy. Based on the result, it shows that the density and molar volume increases as the percent of  $\text{Dy}_2\text{O}_3$  increases. The amorphous nature of this glass was proved from the XRD spectra. On the other hand, FTIR spectra showed the presence of  $\text{Ba}^{2+}$ ,  $\text{BO}_3$ ,  $\text{BO}_4$ , B-O-B linkage, H-O-H and isolated borate on the glass network.

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