

**EFFECT OF ZINC OXIDE AND LEAD OXIDE ON THE PHYSICAL  
PROPERTIES OF BORATE BASED GLASS**

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## ABSTRACT

### EFFECT OF ZINC OXIDE AND LEAD OXIDE ON THE PHYSICAL PROPERTIES OF BORATE BASED GLASS

The glass samples were prepared using melt-quenching technique with chemical composition of  $x(\text{ZnO-PbO}) \cdot (100-x)\text{B}_2\text{O}_3$  where  $x= 0, 5, 10, 15, 20,$  and  $25$  mol% to study the density, molar volume, corrosion rate, FTIR and XRD. The glass samples were prepared with certified reagent grade of PbO (purity 99.0%), ZnO (purity 99.0%), and  $\text{H}_3\text{BO}_3$  (purity 99.8%). The densities of the glass samples are found increases as the PbO and ZnO concentration increase. Meanwhile, the molar volume decreases linearly with increasing of PbO and ZnO content. From the FTIR spectra results, there are several peaks that correspond to the stretching and vibrational of borate base glass functional group. The result on corrosion rates shows that acid solution has stronger corrosion capability than base solution. It was proven that the glass immersed with pH 4 solutions has the higher corrosion rate compare to the glass immersed in pH 9 solution. Meanwhile, the XRD result shows the absence of Bragg's peak thus confirmed the amorphous nature in all glass samples.

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