

38. Electrical Behaviour Of Arsenic Borate glasses

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ABSTRACT

The $\text{As}_2\text{O}_3\text{-B}_2\text{O}_5$ glasses are prepared in the laboratory by sudden quenching method. The dc conductivity of the glasses is measured in the temperature range 348 K to 373 K. The physical properties are also studied. A plot of $\log \sigma$ versus $1/T$ shows linear behavior for various compositions of As_2O_3 . The activation energy is calculated from this plot which is found to be in the range of 0.305 eV to 0.412 eV. The conductivity of these glasses varies from 10^{-8} to 10^{-13} $(\text{ohm.cm})^{-1}$. The dc conductivity of glasses is As_2O_3 dependent and it is observed to be maximum for 20 mol% of As_2O_3 at 473 K. Ionic conduction is observed in these glasses.

The values of density are calculated theoretically and experimentally are not in close agreement with each other. In these glasses the experimental density varies from 2.881 to 3.315 g/cc while the molar volume varies from 30.89 to 43.26 cc per mol.