Abstract:

The effect of the alkali oxide content on viscosity has been studied for sodium-potassium borate glasses. The deviation of viscosity values from additivity has been modeled to investigate the effect of partial substitution of one alkali oxide for another. Published data on isokom temperatures and activation energies for sodium-potassium borate glass compositions has been utilized along with $L^2$-regression optimization technique for analysis.

It is found that both linear and nonlinear relations determine the viscosity coefficients associated with chemical components of the glasses under study. This model allows the calculation of viscosity for a given temperature and accordingly, the fusion temperature of these glasses. Furthermore, the established model relations show first and second order mixed alkali effect on viscosity.

Keywords: Simulation, Viscosity model, sodium-potassium borate glass