

Utilizing the non-bridge oxygen model to predict the glass viscosity

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Abstract

Viscosity is the most important process property of waste glass. Viscosity measurement is difficult and costs much. Non-bridging Oxygen (NBO) model which relates glass composition to viscosity had been developed for high level waste at the Savannah River Site (SRS). This research utilized this NBO model to predict the viscosity of KEPRI's 55 glasses. It was found that there was a linear relationship between the measured viscosity and the predicted viscosity. The NBO model could be used to predict glass viscosity in glass formulation development. However the precision of predicted viscosity is out of satisfaction because the composition ranges are very different between the SRS and KEPRI glasses. The modification of NBO calculation, which included modification of alkaline earth elements and TiO₂, could not strikingly improve the precision of predicted values.