

Role of fluorine in silicate melts and glasses

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Igneous rocks can contain large quantities of halogens such as fluorine. In glass and ceramics science it is well known that the incorporation of halogens into silicate melts drastically affects phase equilibria and transport properties. The interaction of halogens with the silicate network depends on the melt composition and the relative abundance of fluorine. These interactions may cause changes in viscosity that have major implications for volcanic eruptions and the degassing processes that precede them.

We have added different concentrations of F to glasses of the MgO-Al₂O₃-SiO₂ (MAS) and K₂O-Al₂O₃-SiO₂ (KAS) systems. Our glasses were investigated using Raman spectroscopy in order to determine the glass structure and the environment of fluorine. We are also presenting our first measurements of viscosity and heat capacity.