Structure and properties of SrO-Al_2O_3-SiO_2 melts

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Configurational properties of melts and glasses provide fundamental information needed to characterize industrial and geological processes. The main difficulty is to link macroscopic parameters (e.g., configurational entropy) with the atomic structure of melts.

This structural information, related to the aluminosilicate network is affected by the presence and nature of non-network former cations. Indeed, strontium can play a different structural role: either as a modifier that participates in the network depolymerization or as a charge compensator proximal to AlO_4^- tetrahedra.

Information on the configurational entropy (S_{conf}) can be obtained from the viscosity measurements which can then be coupled with various techniques such as Raman spectroscopy, X-ray absorption and neutron or X-ray diffraction. These techniques yield structural information about the short and middle range order.

By combination of all the techniques mentioned above we investigated substitution of Si by Al in strontium aluminosilicate glasses at the constant SrO content.