

**COMPARING THE STRUCTURE OF LITHIUM CONTAINING  
GERMANATE AND SILICATE GLASSES**

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The addition of alkali cations to silicate melts and glasses results in the depolymerisation of the silicate network, and formation of non-bridging oxygens (NBOs). The size of the alkali cation has recently been observed to influence the distribution of Q species ( $Q^3$ ,  $Q^2$ ) that exist within silicate glasses. In particular, lithium-containing glasses have higher  $Q^2/Q^3$  ratios than equivalent Na or K containing glasses. However, this Q species dependence on alkali size appears to be different for germanate melts and glasses. We are currently investigating the Q species distribution between lithium containing silicates and germanate glasses. Silicate and germanate glasses containing from 5 to 30 mol%  $Li_2O$  have been prepared and examined using Si *K*-edge XANES/EXAFS, Si *L*-edge XANES, Raman spectroscopy,  $^{29}Si$  NMR and  $^7Li$  NMR. Our studies have revealed that lithium-containing germanate glasses appear to have a lower  $Q^2/Q^3$  ratio than the equivalent Na- and K-containing compositions. Furthermore, with the addition of lithium, the  $Q^2/Q^3$  ratio increases for silicate glasses, but decreases for germanate glasses. The lithium containing germanate glasses also appear to have greater amounts of  $Q^2$  relative to  $Q^3$  species, than comparable lithium-containing silicate glasses.