

Network Structures and their Dependence on Composition, Temperature and Pressure

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The method of isotopic substitution in neutron diffraction will be briefly summarised and results will be given for the Ge-Se system to show the change in structure with composition and temperature. One issue to be addressed is the variation of the intermediate range order in this system as manifested by changes in the appearance of the so-called first sharp diffraction peak in the measured diffraction patterns at about 1 \AA^{-1} . The results for the covalent glass forming system GeSe_2 will be compared with those recently measured for the ionic glass forming system ZnCl_2 and the nature of the concentration fluctuations in these materials will be discussed. The experimental results will be compared and contrasted with those obtained from molecular dynamics simulations. Finally, the results from recent x-ray diffraction experiments on GeS_2 at high pressures and temperatures will be presented.