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# Local structure and dynamics of tungsten oxide-based glasses: insights from concurrent neutron diffraction and Compton scattering

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In this work, following our previous work on molybdate glasses, we employ a combination of neutron diffraction and neutron Compton scattering, augmented by ab initio harmonic lattice dynamics and Reverse Monte Carlo modelling to characterise the force-constant disorder in the tungsten oxidebased glasses. Specifically, we discuss the correlations between the average interatomic force constant magnitudes inferred from neutron Compton scattering and the glass formation ability, measured in terms of the value of the glass transition temperature, as well as the average bond-lengths and interatomic distances obtained from diffraction data analysis. Moreover, we provide a comparative analysis of the widths of force-constant distributions of individual atomic species in glasses and their precursor metal oxides based on the distributions of the widths of nuclear momentum distributions. Furthermore, we assess the degree of softening of atom-projected vibrational densities of states induced by the force-constant disorder in the glasses

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