XPS-like evaluation of valence-to-core X-ray emission spectra of germanates

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With this work, we aim at exploring the extent to which valence-to-core X-ray emission spectroscopy (vtc-XES) can provide this first- and second-coordination-shell information from amorphous germanium oxides.

We measured the vtc-XES spectra of germanium oxides at ambient and high pressure. The K\textbeta'' emission line, part of the vtc-XES spectra, is sensitive to coordination and oxygen-germanium bond distance as first coordination shell effects. Furthermore, it reflects the different binding energies of bridging and non-bridging oxygen atoms. The Kb'' emission line may thus allow for tracking the coordination and the state of polymerization of a germanium oxide glass under pressure in diamond anvil cells or in other confining environments.

Spiekermann et al. (2019) Persistent octahedral coordination in amorphous GeO\textsubscript{2} up to 100 GPa revealed by Kb'' X-ray emission spectroscopy, Physical Review X, 9, 011025.