

Resonant x-ray emission spectroscopy and x-ray absorption near-edge structure experiments have been performed on Am metal at the L_3 edge as a function of pressure. The hypothesis that the Am valence change at high pressure is associated with a mixing of the $5f_6$ and $5f_7$ configurations, hybridized with the $6d$ valence band, is not substantiated by the experiments. Neither the measured resonant x-ray emission spectroscopy nor x-ray absorption near-edge structure exhibit additional features expected for mixed valence. Only a small shift of about +2 eV of the L_3 edge energy position and a decrease in white line intensity at high pressure is observed. The experimental results at higher pressure may be reproduced by increasing the $6d$ bandwidth and occupation and increasing the $5f$ bandwidth without any change in occupation. Further progress should be directed toward experiments at the Am M edges to observe directly the $5f$ states.

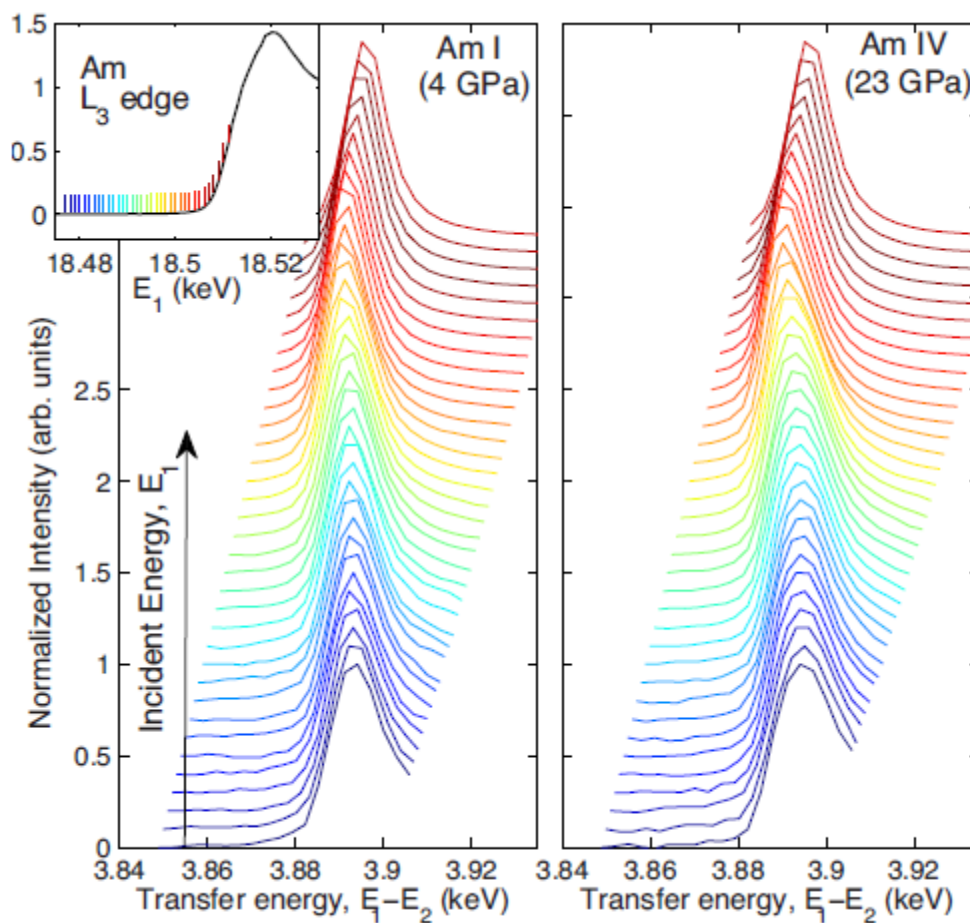


FIG. 1. Resonant emission x-ray scattering intensity for Am phase I at 4 GPa and phase IV at 23 GPa as a function of transfer energy (difference between incident and emission energies) measured at various incident photon energies E_1 , increasing from bottom to top. For clarity, the spectra have been normalized to the same maximum intensity and vertically offset.