High pressure/temperature equation of state of gold silver alloys
ZSOLT JENEI, MAGNUS J. LIPP, JAE-HYUN P. KLEPEIS, HYUNCHAE CYNN, WILLIAM J. EVANS, Lawrence Livermore National Laboratory, CHANGYONG PARK, HPCAT, Advanced Photon Source, Argonne National Laboratory — Gold-silver alloys crystallize in face centered cubic structures, like their constituent pure elements [McKeehan – Phys.Rev. 20, 424 (1922)]. The cell parameter of the alloys does not scale linearly with the ratio of Ag/Au. In this work we investigate the high-pressure/temperature behavior of gold-silver alloys with different Au/Ag ratios. Powder x-ray diffraction experiments performed at HPCAT/Advanced Photon Source confirm the stability of the alloy’s fcc structure to pressures/temperatures exceeding 100 GPa/1000 K. We will present isothermal EOS of the alloys from ambient temperature up to 1000 K, discuss the thermal expansion and its variation with pressure.

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