



Order-disorder phase transition in CdAl_2S_4 under hydrostatic pressure

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Abstract

CdAl_2S_4 single crystals with the defect chalcopyrite structure have been studied by Raman spectroscopy at hydrostatic pressures up to 150 kbar. The Raman scattering spectra were found to undergo substantial changes around 60 and 100 kbar, due to an order-disorder transition in the cation sublattice, which occurs in two stages as predicted earlier. From the pressure dependence of optical phonon frequencies we obtained values for mode shift parameters. The irreversible disappearance of Raman scattering signals at pressures above 140 kbar was attributed to a phase transition from the adamantine structure to a higher symmetry rocksalt-type structure.