



# Pressure-Induced Phase Transitions in Cadmium Thiogallate $\text{CdGa}_2\text{Se}_4$

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## Abstract

The high-pressure behavior of semiconducting cadmium thiogallate  $\text{CdGa}_2\text{Se}_4$  with the defect chalcopyrite structure ( $I_4$ ,  $Z=2$ ) is studied by in situ angle-dispersive synchrotron X-ray powder diffraction and optical reflectivity measurements in a diamond anvil cell at room temperature. At 21 GPa an order–disorder phase transition to the rock-salt structure ( $F43m$ ,  $Z=4$ ) occurs. Upon decompression, the metallic NaCl-type polymorph transforms into zinc-blende ( $Fm3m$ ,  $Z=4$ ) at pressures of 7.5–4 GPa. The recovered metastable semiconducting material is of the zinc-blende type.