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AB₂X₄ Compounds with Other Types of Structures at High Pressures

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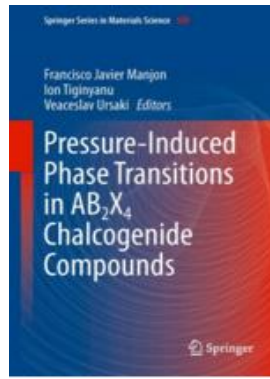
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Abstract

Phase transitions in $A^{II}B^{III}_2X^{VI}_4$ compounds with initial structures different from cubic spinel or tetragonal chalcopyrites and stannites are analyzed in this chapter on the instance of layered $A^{II}InGaS_4$ crystals with Cd, Zn, and Mg as A^{II} cations as well as on the instance of the Zn–Al–S system which provides an initial wurtzite structure in addition to the spinel structure. Apart from that, it is shown that even the behavior of the $ZnAl_2S_4$ with spinel structure under pressure is different from that of $M^{II}In_2S_4$ ($M = Cd, Mg, Mn$) spinel in the sense that a reversible transition to a structure similar to that of calcium ferrite ($CaFe_2O_4$) occurs instead of a phase transition to a variant of NaCl-type structure. It is also shown that quaternary solid solutions $ZnAl_{2(1-x)}Ga_{2x}S_4$ obtained by adding gallium atoms to the system demonstrate a systematics of phase transitions different from that inherent to $A^{II}B^{III}_2X^{VI}_4$ compounds with chalcopyrite, stannite, and spinel structure.

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