Phenomenon Of Polytypism In Melt Grown Layered Crystals of CdI_2 , PbI_2 and $CdBr_2$

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Polytypism has been observed in a large number of materials where the nearest neighbor relationship between identical two-dimensional layers of atoms can be satisfied in more than one way . The phenomenon has posed interesting problem for the Scientists, since the nature of force that causes ordering over the scale ranging from few angstrom to few thousands of angstrom units is not known.

The theoretical and experimental advancements made in the study of polytypism in melt- grown crystals of CdI_2, PbI_2 and $CdBr_2$ in the last few decades have been reviewed. The past work done in this field by us (using optical, Lasers and X-ray diffraction techniques) and update on the aspect of polytypism in the above crystals has been outlined with special reference to the role of:

(1) Purification and effect of impurities (known and unknown);

(2) Solid state phase transitions in the above crystals;

(3) Temperature dependence and their thermodynamic stability.

Keywords: polytypism, x-ray diffraction, melt growth