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Transport property measurements of Bi_2Se_3 crystal grown by Bridgman method

of

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Abstract: This paper deals with the growth of Bi_2Se_3 crystal by newly designed experimental set-up of Bridgman technique in our laboratory. Grown crystal is characterized by EDAX (Energy Dispersive Analysis of X-rays), XRD (X-ray Diffraction), low temperature thermopower measurements (17-284 K), resistivity measurements (16-294 K) and Hall Effect at room temperature in order to study its various properties. The surface study of the grown crystal using AFM (Atomic Force Microscopy) shows a hexagonal unit cell shape whose internal angle determined comes out to be nearly equal to 122.94° which has close resemblance with an angle of 120° of perfect internal angle of hexagon. Various parameters obtained from above measurements like lattice parameters, crystallite size and stacking fault probabilities are discussed in detail in the paper.

Key Words: Crystal growth, transport properties, thermoelectric materials, atomic force microscopy

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