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Characterization of In_4Te_3 Single crystals

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Abstract: Single crystals of In_4Te_3 grown by modified Bridgman technique were characterized by measurement of the Hall coefficient, electrical conductivity and Seebeck coefficient, in the temperature range 200-500 K. The investigated sample was found to be of P-type conductivity.R_H at room temperature was 3.1 \times 10^{14} cm^3/coul and the carrier concentration was evaluated as 2.007 \times 10^{14} cm^3. Energy gap ΔE_g and ionization energy ΔE_a were estimated as 0.28 eV and 0.12 eV, respectively, and the diffusion coefficient, the diffusion length, the mean free time between collision and the effective mass of carriers were evaluated. The variation of the Hall mobility with temperature was studied and hence the scattering mechanism is discussed.

Key Words: In_4Te_3, Hall and Seebeck coefficients, Electrical conductivity

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