

Preparation and properties of $\text{Ag}_{1-x}\text{Sb}_{1+x}\text{Se}_{1.5}\text{Te}_{0.5}$ single crystals

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We have grown $\text{Ag}_{1-x}\text{Sb}_{1+x}\text{Se}_{1.5}\text{Te}_{0.5}$ crystals using vertical Bridgman method. The series of samples with various Ag:Sb atomic ratio ($-0.2 < x < 0.2$) were obtained by mixing of pure elements (99.99%) in appropriate proportions. The materials were molten and pre-synthesized in sealed quartz ampoules at temperature of 900 K.

Grown samples were characterized by X-ray diffraction and electron-probe (EPMA) microanalysis. Thermoelectric properties: Seebeck coefficient, thermal and electrical conductivities were measured from room temperature to 500K. The grown crystals were single-crystal-like, exhibited p-type conductivity and very low thermal conductivity $\lambda < 1 \text{ Wm}^{-1}\text{K}^{-1}$. Seebeck coefficient and electrical conductivity of materials changed with Ag:Sb atomic ratio. The highest Seebeck coefficient of 700 $\mu\text{V/K}$ had a sample derived from a stoichiometric melt.

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