Growth and Thermodynamical Studies of ZnS$_x$Se$_{1-x}$ Single Crystals by Chemical Vapour Transport Technique

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Abstract: In this research, a thermodynamic model used to describe the growth of ZnS$_x$Se$_{1-x}$ single crystals by chemical vapor transport technique with iodine as the transporting agent. The optimum growth condition in the ZnS$_x$Se$_{1-x}$ system has been predicted theoretically based on partial of different components. Some experiments were carried out for growing ZnS$_{0.5}$Se$_{0.5}$ crystals by the chemical vapor transport method using iodine as a transporting agent in the closed ampoule under various conditions. The experimental results showed that the ZnS$_x$Se$_{1-x}$ single crystals, which have been grown with growth parameters close to the theoretically predicted optimum growth conditions, have better quality in comparison with crystals grown under other conditions.

Keywords: chemical vapor transport, ZnS$_x$Se$_{1-x}$, optimum temperature, micromorphology, single crystal.