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Growth Kinetics and Bulk Growth of Inversely Soluble Lithium Sulfate Monohydrate Single Crystals and their Characterization

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Abstract

To facilitate controlled nucleation rate to grow good quality inversely soluble LSMH single crystals, the nucleation kinetics was studied. The number of molecules in a critical nucleus and nucleation rate in LSMH crystallization process have been determined from experimentally measured induction period using classical nucleation theory. A good quality bulk size single crystal of Lithium sulphate monohydrate (LSMH) has been grown with higher growth rate by modified Sankaranarayanan - Ramasamy (SR) method. A systematic investigation on UV-Vis-NIR transmittance, second harmonic generation and thermoluminescence (TL) properties of LSMH single crystals has been carried out to evaluate the optical behavior of the LSMH single crystal. This work also investigates the third order nonlinear optical properties of the LSMH single crystals. Finally thermal behavior of the grown crystal was studied to know the first order phase transition in the grown LSMH single crystals.

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