

GROWTH AND CHARACTERIZATION OF GLYCINIUM MALEATE ORGANIC CRYSTAL

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ABSTRACT

Single crystals of organic glycinium maleate were grown from the aqueous solution of glycine and maleic acid in an equimolar ratio by the slow solvent evaporation technique at ambient temperature. Optically good and colorless prismatic single crystals were harvested with the dimension of $40 \times 16 \times 10 \text{ mm}^3$ in a fortnight. The grown crystals were subjected to single crystal X-ray diffraction and the resultant cell parameter values were compared with the reported values to confirm the coordination formed. In order to identify the functional groups present in the grown crystals, FTIR studies were carried out from 4000 to 450 cm^{-1} . They were further characterized by UV-Vis-NIR transmission and Laser damage threshold studies to determine its optical properties. Powder X-ray diffraction of the grown crystal was recorded and indexed on the corresponding major peaks. Thermal studies such as thermogravimetric (TGA) and differential thermal analysis (DTA) were carried out to find the thermal stability of the grown crystal. Dielectric properties such as dielectric constant and dielectric loss were studied at different frequencies with the function of temperature. To reveal the surface hardness, Vicker's microhardness testing was made on the as-grown crystal, from which yield strength was calculated.

KEYWORDS: Crystal Growth, Crystal Structure, X-ray Diffraction, Nonlinear Optical Crystals, Organic Compounds, Deformation, Harmonic Generation & Dielectric Properties