## ABSTRACT

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The foundation of the modern technology lies on crystals. Several important technologies like microelectronics, optoelectronics, communication, computers, lasers, information technology etc. rely on high quality crystals.

This present work focuses on synthesis, growth and characterisation of some β-alanine based single crystals. A detailed study on β-alanine based crystals is done under the following three categories. Pure β-alanine crystals were grown by slow evaporation technique. β-alanine metal halide and β-alanine metal sulphate compounds were synthesized and the synthesized compounds were also crystalized using slow evaporation technique. Also, β-alanine admixed potassium dihydrogen phosphate (KDP) and ammonium dihydrogen phosphate (ADP) crystals were grown and characterized.

The grown crystals were colourless and highly transparent. The densities of the grown crystals were determined. The presence of functional groups was determined by recording the FTIR transmittance spectrum of the compounds by KBr pellet technique. The elemental composition of the material was studied with the help of CHNS elemental analyser. The structural analysis on the grown crystals was carried out by X-ray diffraction studies (both powder and single crystal). The Vickers hardness test was carried out to determine the mechanical strength of the crystals. The optical characterisation of the grown crystals was done by recording UV-Vis (absorbance, transmittance and diffuse reflectance) spectra. Thermal characterization of the grown crystals was done by recording the TGA, DTA and DSC patterns. Dielectric properties of the grown crystals were determined.