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Synthesis, growth and spectroscopic investigation of a new organic salt crystal: Pyridinium 3-carboxylic acid trichloroacetate

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Abstract

Pyridinium 3-carboxylic acid trichloroacetate was synthesized and single crystals were grown by slow evaporation solution technique. The grown crystals are transparent with dimensions $18 \times 15 \times 3 \text{ mm}^3$. The ^1H and ^{13}C Nuclear magnetic resonance spectra were recorded to establish the molecular structure of the title compound. The crystal structure of the grown crystal was analyzed to reveal the molecular arrangements and formation of hydrogen bonds in the crystal. The grown crystal is subjected to Fourier transform-infra red spectroscopy to identify the functional groups present in the compound. The UV-Vis-NIR analysis shows that it has good transmission in the entire visible region. Thermal properties were investigated by thermogravimetric and differential thermal analysis. The mechanical properties of the grown crystals have been analyzed by Vickers micro hardness method. Crystalline perfection of the grown crystal was analyzed by high resolution X-ray diffraction measurement was carried out.

Key words: Crystal structure; Solubility; Growth from solutions; Optical materials; Mechanical properties; Crystal Growth;

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