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Synthesis, growth and spectroscopic investigation of an organic molecular charge transfer crystal: 8-Hydroxyquinolinium 4-nitrobenzoate 4-nitrobenzoic acid.

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ABSTRACT

An organic intermolecular charge transfer complex salt of 8-Hydroxyquinolinium 4-nitro benzoate 4-nitro benzoic acid (OPNB) has been synthesized. Single crystals of OPNB were grown by slow solvent evaporation solution growth technique at room temperature. The ¹H and ¹³C NMR spectra were recorded to confirm the molecular structure of the complex salt. The crystal structure of OPNB has been determined by single crystal XRD analysis and it belongs to triclinic crystal system with space group P-1. Fourier transform infrared (FT-IR) spectral study has been carried out to identify the various functional groups present. The UV-Vis-NIR transmittance spectrum was recorded in the range 200-2500nm, to find the suitability of the single crystal for various optical applications. The thermal stability of the crystal was investigated using thermo gravimetric (TG) and differential thermal analyses (DTA).

Keywords: charge transfer complex; molecular structure; crystal growth; X-ray diffraction; crystal structure; thermo gravimetry

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