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GROWTH, MORPHOLOGICAL, OPTICAL AND PHYSICAL PROPERTY STUDIES ON NONLINEAR OPTICAL SINGLE CRYSTALS OF MMTD

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ABSTRACT

Nonlinear optical metal organic single crystal of Manganese Mercury Thiocyanate dimethylsulphoxide (MMTD) was grown by slow evaporation technique in aqueous solution. The crystal system and lattice parameters were determined by single crystal X-ray diffraction. FESEM analysis reveals that the surface of the crystal has minor defects and few dislocations. Atomic force microscopy shows that the crystal almost possesses a smooth surface. Energy dispersive X ray analysis confirm the chemical composition of the crystal in weight percentage. FTIR studies confirm the functional groups and formation of the crystalline compound. Kurtz and Perry powder technique confirm the SHG efficiency of MMTD. Epifluorescence studies reveal that the compound shows emission spectra with green fluorescence at 540 nm. Detailed dielectric measurements have been carried out and the dielectric constant was calculated. Photoconductivity studies reveal the photoconducting nature of the sample and the thermal stability was investigated by thermogravimetric analysis.

KEYWORDS: Organometallic, Photoconductivity, X-ray Diffraction, Atomic Force Microscopy