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Spectroscopic, physicochemical and antimicrobial studies of 1-(2,4-dinitrophenyl)-2-[(E)-(3,4,5-trimethoxybenzylidene)] hydrazine single crystal

G Gomathi*[a] & C Selvarasu[b]

[a] Department of Science and Humanities, Dr. N. G. P. Institute of Technology, Kalapatti Main Road, Coimbatore 641 048, India

[b] Department of Chemistry, Anna University, Chennai 600 025, India

E-mail: gomu.research@gmail.com, gomathi.g@drngpit.ac.in, selvachinnaiyan84@gmail.com

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Hydrazides and hydrazones are interesting because of their biological activities and metal extraction capabilities. This work focuses on the single crystal growth of a hydrazone Schiff base, 1-(2,4-dinitrophenyl)-2-[(E)-(3,4,5-trimethoxybenzylidene)]hydrazine (DPTB), using the slow evaporation solution growth technique. Single crystal X-ray diffraction, FTIR, FT-Raman and ^{1}H NMR analyses have confirmed the formation of the DPTB compound. The optical and thermal properties of the title compound have been analyzed to determine the absorption range, bandgap value and melting point. To explore its biological potential, the antimicrobial activity of DPTB has been tested against several human pathogenic bacteria such as *Staphylococcus aureus*, *Bacillus cereus*, *Escherichia coli*, *Klebsiella pneumoniae* and the fungus *Candida albicans*, using resazurin reduction assay. Overall, the findings suggest that DPTB shows promise as both a biologically active molecule and a material of potential interest in coordination chemistry.

Keywords: Organic compound, Hydrazone Schiff base, NLO studies, Antimicrobial studies