




# Thermal and nonlinear optical performances of a new fluid of isatin–oxadiazole hybrid: synthesis and experimental approach

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Received: 20 April 2025

Accepted: 25 July 2025

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## ABSTRACT

This work is aimed to identify a new organic hybrid that exhibits both nonlinear optical (NLO) and thermal performances. Hence, an efficient and scalable method is established for a cyclization reaction to afford valuable isatin–oxadiazole hybrid (IOH), namely, 3'-acetyl-5'-aryl-3-*H*-spiro[indoline-3,2'-[1,3,4]oxadiazol]-2-one (C<sub>17</sub>H<sub>13</sub>N<sub>3</sub>O<sub>3</sub>). The structural representation of IOH is elucidated utilizing various spectral techniques such as NMR, 2D NMR, FT-IR, HRMS, and UV–vis. spectroscopies. After experimental optimizations of IOH, the efficiency of the thermal and NLO properties is evaluated. The thermal conductivity (K), viscosity (η), specific heat (c<sub>p</sub>), the refractive index change (Δn), nonlinear refractive index (NLRI), n<sub>2</sub>, and all-optical switching (AOS) employing the controlling beam (473 nm) and the controlled beams (532 and 635 nm) are investigated. AOS parameters in terms of static and dynamic systems are also studied. By applying the Fresnel–Kirchhoff integral supplemented with the Fraunhofer function approximation, the experimental findings of diffraction patterns (DPs) are numerically estimated. necessary. that the names of the authors and their affiliations are