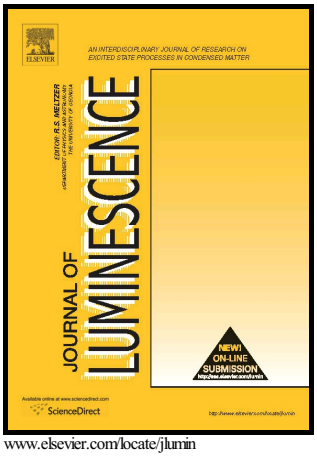

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Multi-stimuli fluorescent behaviour of boron compounds derived from hydrazones in the solid state (Thermochromism, vapochromism, and piezochromism): Synthesis, characterization, and photophysical studies.

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Abstract

Multi-stimuli responsive fluorescent (MSRF) materials can change their photophysical properties upon application of two or more external stimulus such as temperature, mechanical stress, and acid-base vapors. These smart materials have received great attention due to their evident advantages in sensors, probes, displays, data recording, and bioimaging. The synthesis and characterization of (E)-4-hydroxy-N'-(2-hydroxy-4-methoxybenzylidene) benzohydrazide (**1**) and their two new organoboron compounds are described [4-(10-methoxy-2-phenylbenzo[h] [1,3,5,6,2]dioxadiazaboronin-4-yl)phenol (**2**) and 4,4'-(2,2'-(1,4-phenylene)bis(10-methoxybenzo[h] [1,3,5,6,2]dioxadiazaboronine-4,2-diyl))diphenol (**3**)]. The compounds were characterized by NMR (^{1}H, ^{13}C), UV/vis, fluorescence spectroscopy and high-resolution mass spectrometry (HRMS). The photophysical properties of organoboron were investigated; we found low fluorescence emission (Compound **2** Φ_F: 0.89%, compound **3** Φ_F: 0.93%) but in solid state showed interesting luminescent properties such as reversible thermochromism, piezochromism, vapochromism, and mechanochromism are reported.