

Influence of Structural Modifications and Traps on Charge Transport in the Layers of Triazatruxene-Based Semiconductors

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Triazatruxene derivatives are increasingly recognized for their potential in high-performance optoelectronic systems, including OLEDs and photovoltaic devices. In this work, a set of five π conjugated diindolocarbazole compounds with varied sidegroups—specifically hexyl and methoxyphenyl substituents—was synthesized via a sequence involving oxindole trimerization and Ullmann coupling. Structural identity was confirmed through NMR spectroscopy, high-resolution mass spectrometry and elemental analysis [1-5]. Thermogravimetric analysis demonstrated excellent thermal robustness, with decomposition temperatures exceeding 360 °C. Film morphology and crystallinity, assessed via AFM and XRD, revealed substituent-dependent ordering in vacuum-deposited layers. Optical measurements showed UV absorption and moderate fluorescence quantum yields (up to 36%) with lifetimes between 4.9 and 6.7 ns.

Biography

Akaki Kalatozishvili is PhD student at Kaunas university of Technology. His field of interest is a chemistry, engineering and synthesis of organic optoelectronic compounds.

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Abstract received : May 23, 2025 | Abstract accepted : May 25, 2025 | Abstract published : June 13, 2025