

SYNTHESIS OF NONSYMMETRICAL 1,3,4-OXADIAZOLES NEW SMALL-MOLECULE METRIALS FOR OLED DIODES

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Over the past several years, there has been a growing interest in chemical compounds belonging to the 1,3,4-oxadiazole group. It finds diverse range of applications in analysis and pharmacy as well as agriculture and restructuring [1]. Their photoluminescent properties deserve attention because of an extended aromatic system formed around 1,3,4-oxadiazole. Presence of a diazole fragment in the heterocyclic rings of 1,3,4-oxadiazoles acts as electron withdrawing group, that may be found in various linear conductive systems [2]. The appearance of aforementioned fragment greatly enhances quantum yield of fluorescence and stability of the received products. Small-molecule compounds belonging to 1,3,4-oxadiazoles are semiconducting materials often used in active layers of OLED devices.

The aim of my study was to obtain nonsymmetrical 1,3,4-oxadiazoles with strong luminescent properties in solutions as well as in the solid state. Strictly reaction of benzoic acid derivatives with differently substituted benzohydrazides allowed to obtain expected 1,3,4-oxadiazoles (Fig. 1.) [3]. All new 1,3,4-oxadiazole derivatives obtained in this project exhibited significant luminescence. I used an easy and tunable deposition method as a drop-casting – to observed abilities of particles to self-organize in process of creating polycrystalline layers. Furthermore, I have carried out analysis of surface morphology of thin layers utilizing a microscope.

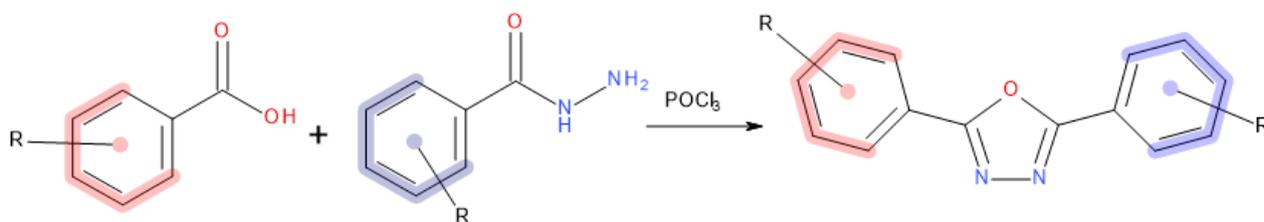


Fig. 1. General procedure for synthesis of 1,3,4-oxadiazoles.

- [1] K. Jasiak, A. Kudelko, W. Zieliński, N. Kuźnik, Study on DDQ-promoted synthesis of 2,5-disubstituted 1,3,4-oxadiazoles from acid hydrazides and aldehydes, *Arkivoc* **ii**, 88, (2017).
- [2] M. Wróblowska, A. Kudelko, N. Kuźnik, K. Łaba, M. Łapkowski, Synthesis of Extended 1,3,4-Oxadiazole and 1,3,4-Thiadiazole Derivatives in the Suzuki Cross-coupling Reactions, *J. Heterocyclic Chem.* **54**, 1550-1557, (2017).
- [3] Z. Wang, H. Zhang, B. J. Killian, F. Jabeen, G. G. Pillai, H. M. Berman, M. Mathelier, A. J. Sibble, J. Yeung, W. Zhou, P. J. Steel, C. D. Hall, A. R. Katritzky, Synthesis, Characterization and Energetic Properties of 1,3,4-Oxadiazoles, *Eur. J. Org. Chem.*, 5183–5188, (2015).