

SYNTHESIS OF HYDRAZIDE HYDRAZONES WITH LUMINESCENT PROPERTIES

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Preparation of organic light-emitting diodes (OLED) is one of the latest and dynamically developing techniques in organic electronics. It uses the unique properties of selected small-molecule organic compounds. Their most important feature is the occurrence of strong luminescent properties. The structure of the molecules enabling the appropriate flow of electrons in thin layers of OLED diodes [1] and a predisposition to create uniform thin layers of solids is also an important aspect during designing new molecules.

The purpose of my research was to obtain small-molecule organic compounds, derivatives of carboxylic acid hydrazides, showing luminescence in thin layer. An additional goal was also to obtain molecules with chemical structure allowing the production of uniform, thin layers, and then to use them in innovative technology to produce active layers in OLED diodes. Hydrazone hydrazones, derivatives of carboxylic acid hydrazides, e.g. salicylic acid, have an appropriate structure that allows both luminescence and the formation of thin layers of solids (Fig. 1.). The emission of these organic compounds in the solution is definitely weaker than in the solid, which indicates the presence of the effect of emission induced by aggregation of molecules called AIE (Aggregation Induced Emission) effect.

The most important issue was the obtainment of molecules with strictly defined physical and chemical properties, expanding the hydrazone core in an appropriate manner. Salicylic acid derivatives have hydroxyl groups in their structure. Thanks to them, hydrogen bonds are easily formed, which exhibit a significant impact on the luminescence as well as self-organization of molecules in thin layers.

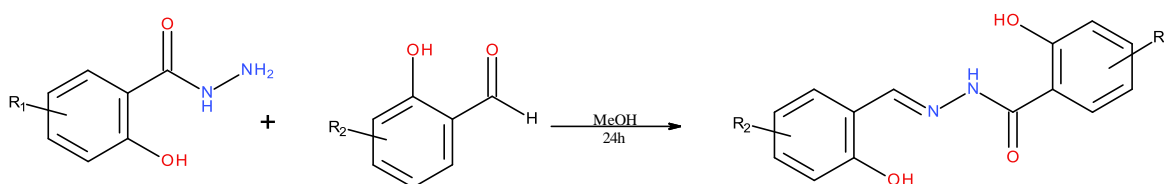


Fig. 1. General scheme of hydrazone hydrazone synthesis

- [1] K. Kotwica, P. Bujak, D. Wamil, A. Pieczonka, G. Wiosna-Salyga, P. A. Gunka, T. Jaroch, R. Nowakowski, B. Łuszczynska, E. Witkowska, I. Głowacki, J. Ulański, M. Zagórska, A. Proń, Structural, Spectroscopic, Electrochemical, and Electroluminescent Properties of Tetraalkoxydinaphthophenazines: New Solution-Processable Nonlinear Azaacenes, *The Journal of Physical Chemistry C* **19**, 10700-10708 (2015).