



Chemistry Department Special e-Seminar

Friday, 07.01.2022 at 15:40 using WebEx

Meeting number: 2674 050 9142

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<https://metu.webex.com/metu/j.php?MTID=me714c7c40e6e9f0f559734a9db68a56c>

The Enantioselective Synthesis of 2-Indolyl-1-Nitro Derivatives and BODIPY Dyes



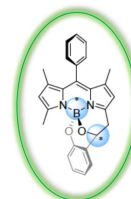
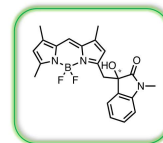
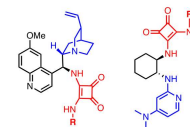
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Abstract: Due to indole's prominent nature in pharmaceutical chemistry, many efforts have been done to synthesize wide variety of optically active 2-indolyl-1-nitro derivatives. Because of versatility of nitro group, these derivatives are useful intermediates for synthesis of tryptamines and 1,2,3,4-tetrahydro- β -carboline. In this study, 2-indolyl-1-nitro derivatives are synthesized via the Friedel-Crafts alkylation of indoles with nitroalkenes in the presence of quinine and 2-aminoDMAP based squaramide bifunctional organocatalysts. In the first part of study, reaction conditions are optimized by testing all organocatalysts and changing the solvent, temperature, catalyst loading as well as concentration. In the optimized condition, 19 different 2-indolyl-1-nitro derivatives were synthesized with different nitroalkenes and indoles.



BODIPY dyes are very special compounds because of their structural versatility and applicability. In the second part of this study, a chiral BODIPY dye is synthesized with the enantioselective addition of BODIPY core to N-Me isatin in the presence of bifunctional organocatalysts. This enantioselective addition reaction is tested in the presence of different quinine based bifunctional squaramides. After finding proper organocatalyst, the reaction is optimized for other variables. In the optimized condition, 4 derivatives are synthesized with different isatins up to now.

In the final part of the study, an interesting BODIPY dye point chiral-at-boron and carbon with a bent-shaped molecular geometry is synthesized through a two-pot, one step synthesis. Also, all chiroptical properties of this dye are investigated.

References:

- 1) Leitch, J. A.; Bhonoah, Y.; Frost, C. G. *ACS Catal.* **2017**, *7*, 5618–5627.
- 2) Kanberoğlu, E.; Tanyeli, C. *Asian J. Org. Chem.* **2016**, *5*, 114–119. & Isık, M.; Unver, M. Y.; Tanyeli, C. *J. Org. Chem.* **2015**, *80*, 828–835.
- 3) Dünder, E.; Tanyeli, C. *Tetrahedron Lett.* **2021**, *73*, 153153.
- 4) Lu, H.; Mack, J.; Nyokong, T.; Kobayashi, N.; Shen, Z. *Coord. Chem. Rev.* **2016**, *318*, 1–15.