



Chemistry Department Special e-Seminar

Friday, 24.12.2021 at 15:40 using Zoom

Meeting ID: 938 2482 9003

Passcode: Chem601

<https://zoom.us/j/93824829003?pwd=SnE3K1dvTDlWOhpDYmw1akU5dTFZQT09>

Evaluation of the Bifunctional Organocatalysts in Friedel-Crafts/Substitution Domino Type Reactions & Synthesis of Heterogeneous Recyclable Organocatalysts



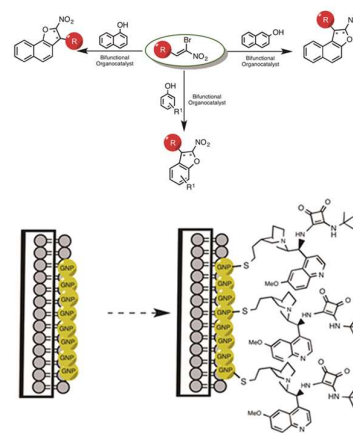
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Abstract: Friedel-Crafts (FC) reaction is one of the most common and widely used C-C bond forming reaction in synthetic organic chemistry. Applications of these reactions in domino type reactions are trending topic in organocatalytic studies in the recent years.^{1,2} These types of reactions are used to construct dihydrobenzofuran (DHB) and dihydronaphthofuran (DHN) skeletons, which are very important pharmaceutical precursors. In this study, FC was chosen as the key step in domino reaction to afford disubstituted dihydronaphthofuran derivatives possessing two chiral centers in enantiomerically enriched form. For this purpose, (*Z*)-(2-bromo-2-nitrovinyl)benzene and β -naphthol undergo a model organocatalytic FC/substitution domino type reaction. Initial studies involved the screening of 2-aminoDMAP based and quinine based bifunctional organocatalysts.³ After choosing the proper organocatalyst, the reaction condition was optimized. With the optimized condition in hand, further derivatization studies have started with a wide range of (*Z*)-(2-bromo-2-nitrovinyl)benzene derivatives involving donor and acceptor type substituents. Additionally, α -naphthols and phenolic type nucleophilic components have been used. Consequently, 61 DHB and DHN derivatives were synthesized with good results with 2-adamantyl quinine bifunctional organocatalyst. In the second part of the study, novel heterogeneous catalysts are constructed from our homogeneous catalysts.⁴ For this purpose, initial trials with the small amount of catalyst have started to generate the active site for the attachment to gold nanoparticles. The attachment of the catalysts to the gold surfaces were also performed. The other characterization studies of these catalysts were completed and they will be tested in different type of asymmetric reactions.



References:

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3. a) Işık, M.; Unver, M. Y.; Tanyeli, C. *J. Org. Chem.* **2015**, *80*, 828-835. b) Kanberoğlu, E.; Tanyeli, C., *Asian J. Org. Chem.*, **2016**, *5*, 114-119.
4. Susam, Z.D.; Tanyeli, C., *Asian J. Org. Chem.* **2021**, *10*, 1251-1266.