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Literature Seminar

When: October 22, 2020
Time: 2:30 PM
Location: Microsoft TEAMS

Recent Advances in the Synthesis and Functionality of Selected Heterocyclic Compounds

Abstract

In recent years, the exploration of novel synthetically appealing and structurally important complex molecular architectures has received tremendous attention from the synthetic community.[1] To achieve this, the development of plausible practical reaction patterns such as multi-component or cascade reactions with the potential to provide simultaneous or sequential multi-bond formation events has been established. These reactions have enabled good to excellent yields, great regio or stereoselectivity controls without compromising the principles of green chemistry, consequently providing biologically active agents and pharmaceutical leads.[2] The use of a Bronsted acid catalyst in some new synthetic strategies is discussed. These include the transition metal catalyzed interception of an in situ generated active oxonium ylide in a pinacol-type rearrangement and cascade annulation strategy to afford α-(3-indolyl) ketones. An enantioselective cyclization of diazoindolenones with o-hydroxymethyl chalcones through a cooperative dirhodium complex and chiral phosphonic acid catalysis in a Michael-type addition also afforded the spirochroman-3,3-oxindoles and its derivatives.[3]A mild synthesis of carbazole and related building blocks through a visible light-induced intramolecular C-H amination reaction presents a striking advantage with the use of a more reactive aryl sulfilimine instead of the corresponding hazardous azide is herein reported.[4]

References

1. Samrat K.; Ankush B.; Modhu S. M. Bronsted Acid-Catalyzed Tandem Pinacol-Type Rearrangement for the Synthesis of α-(3-Indolyl) Ketones Using α-Hydroxy Aldehydes. *J Org. chem*. **2019**, 84, 16003 - 16012.
2. Barbas, C. F.; Tan, B.; Ishihara, Y.; Cheng, D. Organocatalytic Asymmetric Assembly Reactions: Synthesis of Spirooxindoles via Organocascade Strategies. *ACS Catal.* **2014**, 4, 743 - 762.
3. Alavala, G.P. R.; Pedireddi, N.; Su Z.; Shi-Kun, J.; Taoda, S.; Xianfang, X.; Yu, Q.; Wenhao, H. Bronsted Acid Catalyzed Enantioselective Assembly of Spirochroman-3,3-oxindoles. *Org. Lette*. **2020**, 22, 2925 - 2930.
4. Xianhai, T.; Lina, S.; Hashmi, S. K. Synthesis of Carbazoles and Related Heterocycles from Sulfilimines by Intramolecular C-H Aminations. *Angew. Chem. Int. Ed*. **2020**, 59, 12342 - 12346.