第 751 回　化学・物質工学セミナー開催のお知らせ

下記の通りセミナーを開催致します。万障お繰り合わせの上，ご参加下さい。

記

日時：2025 年 8 月 29 日（金）　16：10 ～ 17：40

場所：工学部 1 号館　11 番講義室

講師：Prof. Dr. Norbert KRAUSE　（TU Dortmund University　教授）

演 題 ： Environmentally Responsible Organic Synthesis: Catalysts, Solvents, Recycling

【講演概要】

別途添付資料をご確認ください。

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Environmentally Responsible Organic Synthesis: Catalysts, Solvents, Recycling

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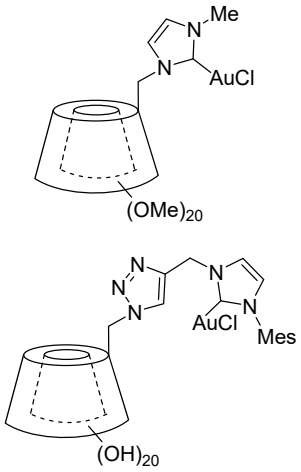
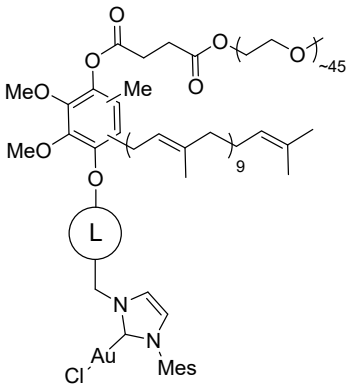
Organic solvents continue to be the reaction media of choice for transformations of organic substrates, notwithstanding the fact that they are the major source of waste in academia and industry. An attractive alternative is the use of water as reaction medium for catalytic transformations. This can be achieved by taking advantage of micelles as nanoreactor for unpolar substrates and catalysts,[1] or by designing water-soluble catalysts.[2] Recently, we have synthesized a library of cyclodextrin-tagged NHC-gold(I) complexes which show excellent catalytic activity, recyclability, and even enantioselectivity in cyclization reactions of functionalized allenes or alkynes in bulk water.[3] Moreover, we have linked the NHC-gold(I) moiety to the designer surfactant PQS and obtained water-soluble catalysts which show extremely low gold leaching upon recycling in bulk water.[4] Finally, it is also possible to avoid the use of precious transition metals in cyclization reactions of functionalized alkynes by taking advantage of hexafluoroisopropanol (HFIP) as a source for anhydrous HCl.[5]

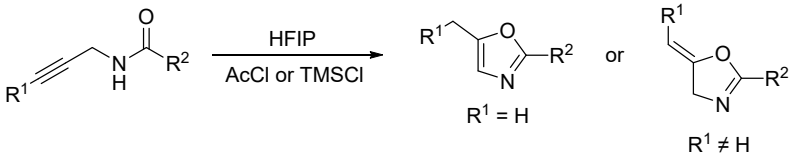
Cyclodextrin-tagged NHC-Gold Catalysts:



PQS-tagged NHC-Gold Catalysts:



Transition Metal-free Cyclizations:



[1] Krause, N. *Curr. Opin. Green. Sustain. Chem.* **2017**, *7*, 18. Minkler, S. R. K.; Lipshutz, B. H.; Krause, N. *Angew. Chem. Int. Ed.* **2011**, *50*, 7820. Minkler, S. R. K.; Isley, N. A.; Lippincott, D. J.; Krause, N.; Lipshutz, B. H. *Org. Lett.* **2014**, *16*, 724. Lempke, L.; Ernst, A.; Kahl, F.; Weberskirch, R.; Krause, N. *Adv. Synth. Catal.* **2016**, *358*, 1491.

[2] Belger, K.; Krause, N. *Eur. J. Org. Chem.* **2015**, 220. Belger, K.; Krause, N. *Org. Biomol. Chem.* **2015**, *13*, 8556.

[3] Sak, H.; Mawick, M.; Krause, N. *ChemCatChem* **2019**, *11*, 5821. Sassenscheidt, L.; Terhorst, K.; Versinskaite, I.; Sak, H.; Krause, N. submitted.

[4] Ballmann, M.; Ruer, P. C.; Hofnagel, O.; Hiller, W.; Krause, N. *ACS Sustainable Chem. Eng.* **2022**, *10*, 7288.

[5] Jankowski, N.; Krause, N. *Adv. Synth. Catal.* **2022**, *364*, 3404. Jankowski, N.; Krause, N. *Asian J. Org. Chem.* **2025**, e202500252.