

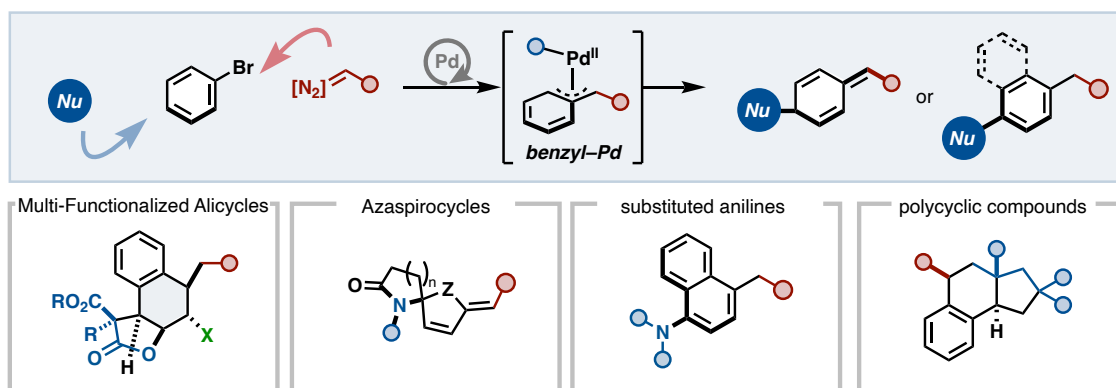
Multi-Dimensional Transformation of Arenes: Catalytic Dearomatization and Difunctionalization

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Transformation of arenes is one of the central topics in organic synthesis. Classically, Friedel–Crafts and cross-coupling reaction have been studied. Compared to these single σ -bond transformations, multi-dimensional transformations such as difunctionalization and dearomatizative functionalization are still underdeveloped. These reactions can be a powerful methodology to synthesize diverse range of molecules from simple and abundant arenes, potentially opening a new avenue in the arene transformations.

This lecture presents that our achievement on the development of catalytic dearomatization as well as difunctionalization of simple (pseudo)haloareenes with diazo compounds and nucleophiles through benzyl-Pd catalysis.^[1–3] The key for these reactions is adopting a unique reactivity of benzyl-Pd catalytic intermediate. The present methodology can synthesize various molecules such as multi-functionalized alicycles,^[1] azaspirocycles,^[2] *para*-substituted anilines,^[3] and polycyclic compounds.^[4] Some of the reactions allowed for the total synthesis of natural products.^[5]



[1] Kato, H.; Musha, I.; Komatsuda, M.; Muto, K.; Yamaguchi, J. *Chem. Sci.* **2020**, *11*, 8779.

[2] Yanagimoto, A.; Uwabe, Y.; Wu, Q.; Muto, K.; Yamaguchi, J. *ACS Catal.* **2021**, *11*, 10429.

[3] Wu, Q.; Muto, K.; Yamaguchi, J. *Org. Lett.* **2022**, *24*, 4129.

[4] *unpublished result*

[5] Uwabe, Y.; Muto, K.; Yamaguchi, J. *Chem. Eur. J.* **2023**, in press.