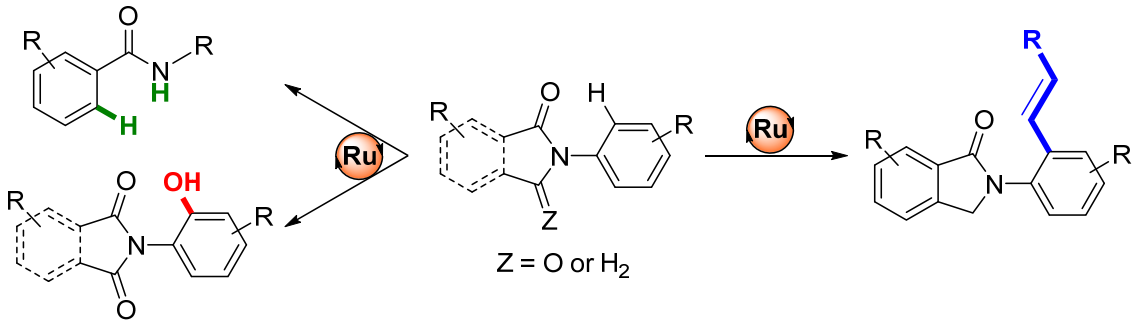
SELECTIVE FUNCTIONALIZATION OF CYCLIC IMIDES AND AMIDES WITH RUTHENIUM CATALYSTS

Yuchao Yuan, Christian Bruneau, and Rafael Gramage-Doria

Université de Rennes 1, CNRS, 35042 Rennes, France

Cyclic imides and amides are one of the most widely used functional groups in chemical synthesis and they are also present in many relevant molecules from pharmacology to materials sciences.[1] As such, the development of selective and efficient functionalizations within this backbone is highly attractive although it remains scarce to date.[2] In this contribution, I will show the use of benchmark and robust ruthenium catalysts to tackle unprecedented transformations with cyclic a/imides. In particular, we have found a single step protocol leading to amides starting from phthalimides *via* selective scission of C-C and C-N bonds with unexpected CO_2 release.[3] Furthermore, I will present the first use of cyclic amides as weak directing groups in transition metal-catalyzed C-H bond functionalizations. Regio- and site-selective hydroxylation and alkenylation reactions have been accomplished, including the late-stage derivatization of a drug.[4]



Acknowledgements: CNRS, University of Rennes 1, China Scholarship Council, COST-15106 CHAOS.

---

[1] (a) Gibson, M. S.; Bradshaw, R. W. *Angew. Chem. Int. Ed.* **1968**, *7*, 919-930. (b) Ragnarsson, U.; Grehn, L. *Acc. Chem. Res.* **1991**, *24*, 285-290. (c) Wu, Y.; Zhu, W. *Chem. Soc. Rev.* **2013**, *42*, 2039-2058.

[2] Yuan, Y.-C.; Bruneau, C.; Gramage-Doria, R. *Synthesis* **2018**, *50*, 4216-4228.

[3] Yuan, Y.-C.; Kamaraj, R.; Bruneau, C.; Labasque, T.; Roisnel, T.; Gramage-Doria, R. *Org. Lett.* **2017**, *19*, 6404-6407.

[4] (a) Yuan, Y.-C.; Bruneau, C.; Dorcet, V.; Roisnel, T.; Gramage-Doria, R. *J. Org. Chem.* **2019**, *84*, 1898-1907. (b) Yuan, Y.-C.; Bruneau, C.; Roisnel, T.; Gramage-Doria, R. *submitted*.