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IL02 – Chelation-Assisted Catalytic C–H Functionalization
by Means of Electrochemical Oxidation

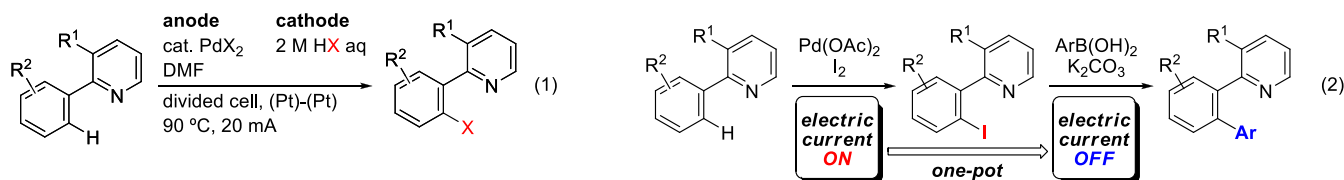
Fumitoshi Kakiuchi*

Department of Chemistry, Faculty of Science and Technology, Keio University, 3-14-1 Hiyoshi, Kohoku-ku, Yokohama, Kanagawa 223-8522, Japan

E-mail: kakiuchi@chem.keio.ac.jp

Catalytic functionalization of carbon-hydrogen bonds are highly attractive research subjects in organic synthesis. A variety of strategies for C–H functionalization have been reported by many research groups. We have reported several methods for transition metal-catalyzed C–C, C–Si, and C–halogen bond formations via C–H bond cleavages. Here, we describe palladium-catalyzed C–H halogenation and its application by means of electrochemical oxidation.

Combination of palladium-catalyzed ortho-selective aromatic C–H bond cleavage and halogenation with electrochemically generated X^+ ($X = \text{Cl}, \text{Br}$) enables highly efficient, selective halogenations of aromatic compounds in a green-sustainable manner (eq 1).¹ This C–H halogenation can be extended to tandem reaction of C–H iodination and coupling of generated aryl iodides with arylboronic acid by ON/OFF switching of two different catalytic cycles using the same palladium catalyst in a one-pot fashion (eq 2).² This C–H iodination can be used for regioselective homocoupling of arenes under anodic oxidation conditions using I_2 as a mediator.³



References

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