

Novel Production Method for Sulfonamide

Background:

In light of the importance of arylamine derivatives in organic materials, pharmaceuticals, and agrochemicals, the development of efficient aromatic C–H amination has long been sought after. Although many attempts have been made to achieve dehydrogenative C–H amination, the low reactivity of simple arenes renders equimolar coupling with amine derivatives a formidable task in synthetic chemistry.

Technology Overview:

The researchers in Nagoya University invented equimolar C–H/N–H coupling of arenes and sulfonimides through dehydrogenative aromatic imidation. This was accomplished by means of a ruthenium-based photoredox mediator that employed the arene as the limiting reagent. A wide range of arenes, such as polycyclic aromatic hydrocarbons and heteroarenes, as well as a variety of sulfonimides, were applicable to the reaction. This electrochemistry-based mechanistic study has uncovered that the coupling reaction is initiated by the oxidation of sulfonimides by the ruthenium catalyst.

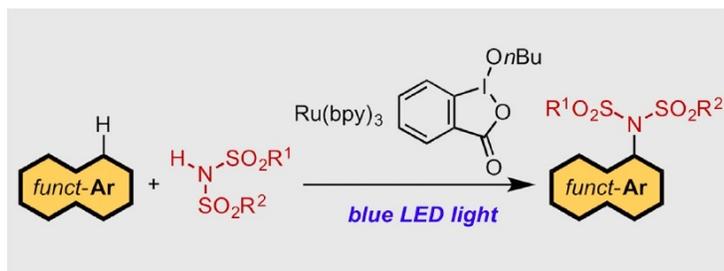
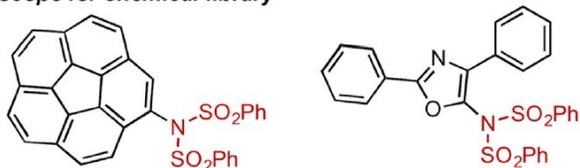
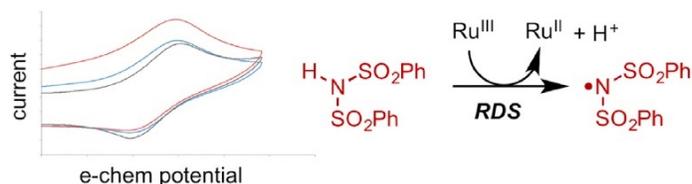


Figure 1: A method for the equimolar dehydrogenative coupling of arenes and imides. Under the influence of a ruthenium catalyst over blue-light irradiation, a range of simple and widely available arenes and sulfonimides can be coupled.

Wide scope for chemical library



Mechanistic study by electrochemistry



Further Details:

Ito *et al.*, 'Catalytic Dehydrogenative C–H Imidation of Arenes Enabled by Photo-generated Hole Donation to Sulfonimide.' *Chem*, 2017 March 2 (3): 383-392

IP Status:

A patent application has been filed.

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