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New conceptual diaryliodonium salts for metal-free arylation of carboxylic acids and other coupling reactions

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Diaryliodonium salts are used in organic synthesis as versatile arylating agents and for other many applications. However, the methods utilizing these salts in synthesis still have limitations, such as the requirements of base, and sometimes accompanied problems in the product yields and aryl selectivities for low nucleophilic compounds and the salts having two different aryl groups. Herein, we have developed a more efficient arylation of carboxylic acids meeting green chemistry by utilizing new conceptual diaryliodonium salts. By utilizing the newly designed salts 1, the efficient metal-free arylations of carboxylic acids occur upon heating without base and solvent, giving aryl esters in extremely high yields in short reaction times. In comparison, the reactions are more efficient, especially for low nucleophilic carboxylic acids, such as p-nitrobenzoic acid, that were unsatisfactory as substrates in known intermolecular coupling methods using ordinary diaryliodonium salts. In addition, the arylations usually proceeded with perfect chemoselectivities even in the presence of other nucleophilic groups.



It is known that diaryliodonium salts show unique reactivities' for other metal-free arylating reactions depending on the nature of the ligands. The summary of developments in our laboratory is presented together with the recent research study.

Biography

Toshifumi Dohi received his PhD in 2005 (Y. Kita), subsequently became Assistant Professor at Osaka University and Ritsumeikan University, and was promoted to Associate Professor (PI) in 2014. He received the IUPAC-ICOS 15 Poster Award for most excellent presentation, the PSJ Award for Young Scientists (2009), Banyu Chemist Award (2013), Thieme Chemistry Journal Award (2014), and GSC Encouragement Award (2015). His current research interest in organic synthesis is focused on hypervalent iodine chemistry.

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