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Oxidative cross-dehydrogenative coupling with selective C-O bond formation

Oxidative cross-dehydrogenative coupling methodology lies in the modern trend of organic chemistry. It eliminates necessity for installation of additional functional groups and affords direct coupling in one stage (via selective C-H activation) with limited amount of wastes, high atom- and step- economy. Oxidative cross-dehydrogenative C-C coupling was studied in most detail; the C-N, C-P, and C-O cross-coupling reactions are less well developed. It is difficult to achieve high selectivity in the cross-dehydrogenative C-O coupling because the starting compounds are prone to side oxidation and fragmentation reactions giving, for example, alcohols and carbonyl compounds. This gives rise to a problem of searching for oxidizing agents and reaction conditions suitable for the cross-coupling of different types of substrates. We discovered oxidative cross-dehydrogenative C-O coupling of 1,3-dicarbonyl compounds and their heteroanalogues with peroxides, oximes and hydroxyamides. The best results were obtained with the use of the widely available copper, iron, manganese or lanthanide salts as catalysts or oxidants.

Biography

Alexander O Terent'ev was born in Moscow, in 1973. He received his M.S. in Chemistry of Biologically Active Compounds from D. Mendeleev University of Chemical Technology of Russia, Moscow. PhD degree (2000) and D.Sc. degree (2009) in Organic Chemistry in N.D. Zelinsky Institute of Organic Chemistry RAS. 2011 – Professor D. Mendeleev University of Chemical Technology of Russia. 2016 – Professor RAS. Head of laboratory in N.D. Zelinsky Institute of Organic Chemistry RAS, Head of laboratory in All-Russian Research Institute of Phytopathology. His interests are organic chemistry, medical and agricultural chemistry, chemical technology. He published 3 chapters in books, 90 research papers, and 24 patents.

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