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Pd-catalyzed oxidation of unsaturated hydrocarbons with O_2

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Oxidation reactions are central components of organic chemistry, and have shown their importance in modern organic synthesis, materials and microelectronic sciences, pharmaceutical industries. Although researchers have developed new organic oxidation methods in recent years, the chemistry community faces continuing challenges to use "green" reagents and maximize atom economy. Undoubtedly, with its low cost and lack of environmentally hazardous byproducts, molecular oxygen (O2) is an ideal oxidant. As a result, we focused our attention on the development of versatile aerobic reactions of unsaturated hydrocarbons through the appropriate choice of Pd catalysts and O_2.

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Palladium-catalyzed cascade reactions of alkynes with alkenes in ionic liquids

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Palladium-catalyzed cascade reactions are now established as a captivating branch of organic chemistry for the construction of both carbon-carbon and/or carbon-heteroatom bonds. Moreover, ionic liquids (ILs) are regarded as "green" solvents and have shown great promise in transition metal-catalyzed coupling reactions in the last decades. Recently, we have preliminarily studied the palladium-catalyzed coupling reactions of alkynes with alkenes in ionic liquids, and developed a series of efficient cascade approaches to afford highly functionalized tetra substituted alkenes in good yields with excellent control of regio- and stereo selectivity (Scheme 1).

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