Recent Advances in the Nano-catalytic Knoevenagel Condensation

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Abstract:

α,β-Unsaturated acids are well-known and useful reagents, and they have been applied in different fields due to their fascinating properties. The catalytic Knoevenagel condensation reaction is one of the most remarkable methods for the formation of C=C bonds. The multi-substituted alkenes can be obtained from the reaction of carbonyl and active methylene compounds in the presence of base catalysts, Brønsted catalysts, Lewis acid catalysts, or ionic liquids. In terms of providing both desirable structural diversity and compound libraries, Doebner-Knoevenagel condensation is the most efficient strategy. There is a high demand for an efficient, rapid, environment-friendly, and sustainable catalytic protocol under milder conditions for the stereoselective synthesis of Knoevenagel products, which can tolerate a wide variety of functionality. Carrying out the transformations through alternative reagents, catalysts, or methods provide a valuable and broad space for selectivity. Herein, the recent advances in the synthesis of structurally diversified Knoevenagel products using nanocatalysts are reviewed.

Keywords: Nano-Catalysts, Knoevenagel Condensation, Active Hydrogen Compound, Carbonyl Group, A, B-Unsaturated Compound