

Cobalt Nanoparticles Promoted Highly Efficient One Pot Four-Component Synthesis of 1,4-Dihydropyridines under Solvent-Free Conditions

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摘要 A straightforward and general method has been developed for the synthesis of C₅-unsubstituted 1,4-dihydropyridines by a reaction using dimedone, acetophenone, aromatic aldehydes, and ammonium acetate in the presence of a catalytic amount of Co nanoparticles as a heterogeneous and eco-friendly catalyst with high catalytic activity at room temperature under solvent-free conditions. This catalyst is easily separated by magnetic devices and can be reused without any apparent loss of activity for the reaction. In addition, it is very interesting that when using Co nanoparticles as a catalyst, spatially-hindered aldehydes such as 2-methoxy-, 2-fluoro-, and 2-chloro-aldehydes are suitable for this reaction.

关键词: [cobalt nanoparticle](#) [1,4-dihydropyridine](#) [four-component condensation](#) [heterogeneous catalyst](#) [magnetically separable catalyst](#)

Abstract: A straightforward and general method has been developed for the synthesis of C₅-unsubstituted 1,4-dihydropyridines by a reaction using dimedone, acetophenone, aromatic aldehydes, and ammonium acetate in the presence of a catalytic amount of Co nanoparticles as a heterogeneous and eco-friendly catalyst with high catalytic activity at room temperature under solvent-free conditions. This catalyst is easily separated by magnetic devices and can be reused without any apparent loss of activity for the reaction. In addition, it is very interesting that when using Co nanoparticles as a catalyst, spatially-hindered aldehydes such as 2-methoxy-, 2-fluoro-, and 2-chloro-aldehydes are suitable for this reaction.

Keywords: [cobalt nanoparticle](#), [1,4-dihydropyridine](#), [four-component condensation](#), [heterogeneous catalyst](#), [magnetically separable catalyst](#)

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