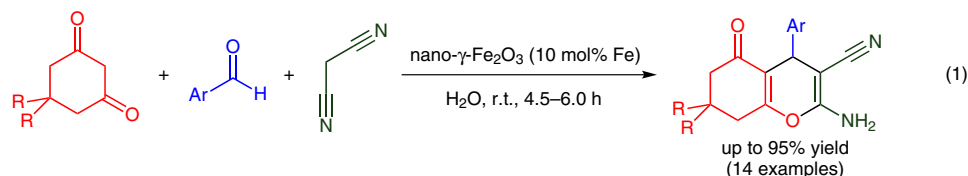
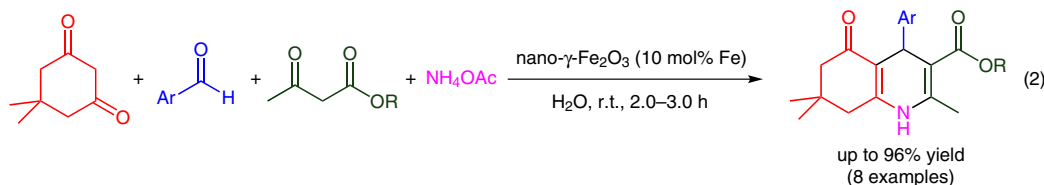
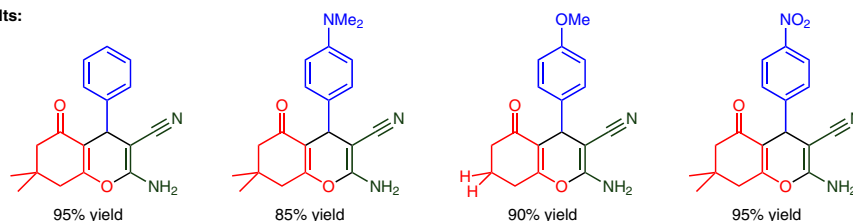


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Water Dispersed Magnetic Nanoparticles (H₂O-DMNPs) of γ -Fe₂O₃ for Multicomponent Coupling Reactions: a Green, Single-Pot Technique for the Synthesis of Tetrahydro-4*H*-chromenes and Hexahydroquinoline Carboxylates
Tetrahedron Lett. **2013**, 54, 3344–3347.

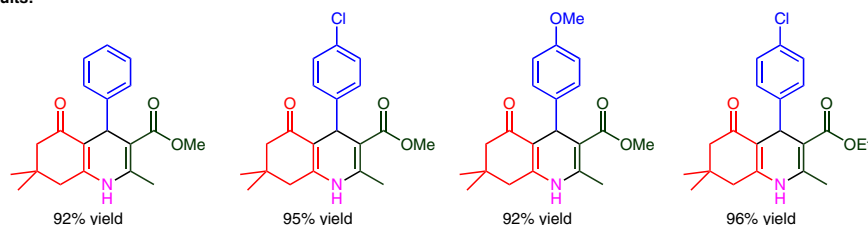
Synthesis of Tetrahydro-4*H*-chromenes Using Nano γ -Fe₂O₃ in H₂O



Typical results:



Typical results:



Significance: γ -Fe₂O₃ magnetic nanoparticles (nano- γ -Fe₂O₃), which were dispersed by ultrasonic irradiation in water, catalyzed the three-component condensation reaction of 1,3-cyclohexanediones, arylaldehydes, and malononitrile to give the corresponding tetrahydro-4*H*-chromenes in up to 95% yield (14 examples, eq. 1). The dispersed nano- γ -Fe₂O₃ was also effective for the four-component reaction of dimedone, arylaldehydes, β -keto esters, and NH₄OAc to afford the corresponding hexahydroquinoline carboxylates in up to 96% yield (8 examples, eq. 2).

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Comment: The catalytic activity of the dispersed nano- γ -Fe₂O₃ was superior to that of FeCl₃, Fe(NO₃)₃, bulk-Fe₃O₄, nano-Fe₃O₄ and non-dispersed nano- γ -Fe₂O₃. In the formation of tetrahydro-4*H*-chromenes, the catalyst was recovered magnetically and reused four times.