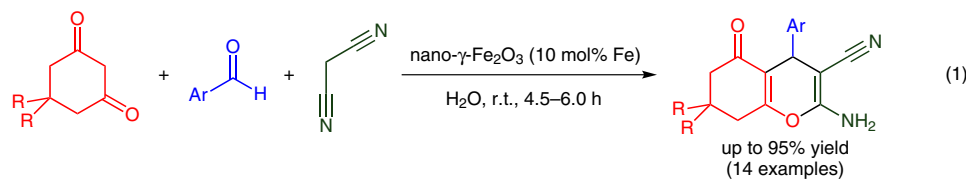
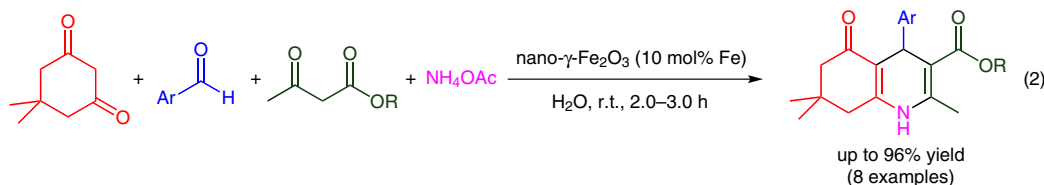
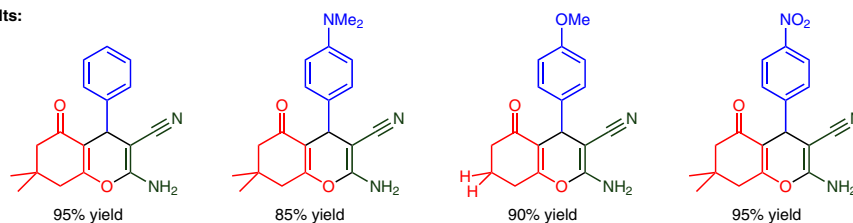


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Water Dispersed Magnetic Nanoparticles (H<sub>2</sub>O-DMNPs) of  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> for Multicomponent Coupling Reactions: a Green, Single-Pot Technique for the Synthesis of Tetrahydro-4H-chromenes and Hexahydroquinoline Carboxylates  
*Tetrahedron Lett.* **2013**, *54*, 3344–3347.

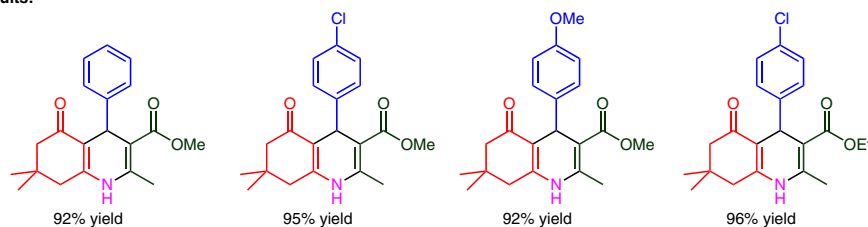
## Synthesis of Tetrahydro-4H-chromenes Using Nano $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> in H<sub>2</sub>O



Typical results:



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**Significance:**  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> magnetic nanoparticles (nano- $\gamma$ -Fe<sub>2</sub>O<sub>3</sub>), 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-4H-chromenes in up to 95% yield (14 examples, eq. 1). The dispersed nano- $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> was also effective for the four-component reaction of dimedone, arylaldehydes,  $\beta$ -keto esters, and NH<sub>4</sub>OAc 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- $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> was superior to that of FeCl<sub>3</sub>, Fe(NO<sub>3</sub>)<sub>3</sub>, bulk-Fe<sub>3</sub>O<sub>4</sub>, nano-Fe<sub>3</sub>O<sub>4</sub> and non-dispersed nano- $\gamma$ -Fe<sub>2</sub>O<sub>3</sub>. In the formation of tetrahydro-4H-chromenes, the catalyst was recovered magnetically and reused four times.