Category

Polymer-Supported Synthesis

Key words

cobalt oxide

magnetite

hydroacylation

azodicarboxylates

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Cobalt-Impregnated Magnetite as General Heterogeneous Catalyst for the Hydroacylation Reaction of Azodicarboxylates

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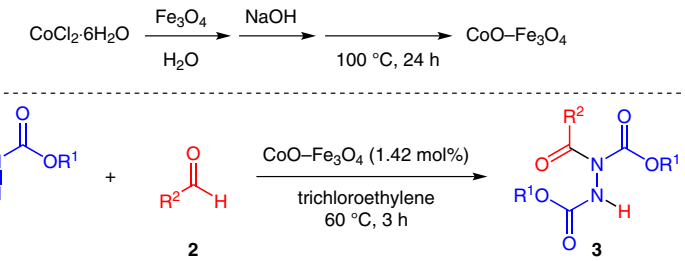
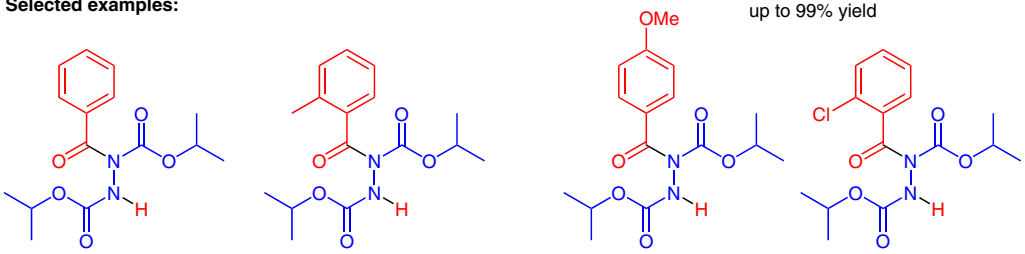
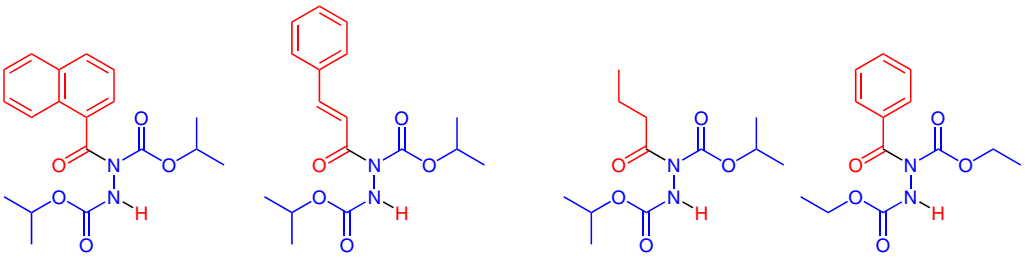
Hydroacylation of Azodicarboxylates with Aldehydes Using CoO–Fe_3O_4



Selected examples:



3a 89% yield **3b** 86% yield **3c** 67% yield **3d** 95% yield



3e 87% yield **3f** 74% yield **3g** 99% yield **3h** 99% yield

Significance: Magnetite-supported cobalt oxide (CoO–Fe_3O_4) was prepared by mixing $CoCl_2 \cdot 6H_2O$ and Fe_3O_4 in water followed by treatment with NaOH (eq. 1). CoO–Fe_3O_4 catalyzed the hydroacylation of azodicarboxylates **1** with aldehydes **2** in trichloroethylene to afford the hydroacylated products **3** in up to 99% yield (eq. 2).

Comment: In the formation of **3a**, the catalyst was recovered by magnetic separation and reused nine times with slight loss of its catalytic activity. The catalytic activity of CoO–Fe_3O_4 was superior to that of the other metal oxides supported on Fe_3O_4 (NiO–Fe_3O_4, CuO–Fe_3O_4, Ru_2O_3–Fe_3O_4, Rh_2O_3–Fe_3O_4, PdO–Fe_3O_4, Ag_2O/Ag–Fe_3O_4, WO_x–Fe_3O_4, OsO–Fe_3O_4, PtO/PtO_2–Fe_3O_4, Au_2O_3/Au–Fe_3O_4, NiO/Cu–Fe_3O_4, PdO/Cu–Fe_3O_4) and unsupported CoO.

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