Hydroacylation of Azodicarboxylates with Aldehydes Using CoO–Fe₃O₄

**Significance:** Magnetite-supported cobalt oxide (CoO–Fe₃O₄) was prepared by mixing CoCl₂·6H₂O and Fe₃O₄ in water followed by treatment with NaOH (eq. 1). CoO–Fe₃O₄ 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–Fe₃O₄ was superior to that of the other metal oxides supported on Fe₃O₄ (NiO–Fe₃O₄, CuO–Fe₃O₄, Ru₂O₃–Fe₃O₄, Rh₂O₃–Fe₃O₄, PdO–Fe₃O₄, Ag₂O/Ag–Fe₃O₄, WOₓ–Fe₃O₄, OsO–Fe₃O₄, PtO/PtO₂–Fe₃O₄, Au₂O/Au–Fe₃O₄, NiO/Cu–Fe₃O₄, PdO/Cu–Fe₃O₄ and unsupported CoO.

**Selected examples:**

- **3a** 89% yield
- **3b** 66% yield
- **3c** 67% yield
- **3d** 95% yield
- **3e** 87% yield
- **3f** 74% yield
- **3g** 99% yield
- **3h** 99% yield

**References:**