Regio- and Enantioselective Hydrogenation Using a Peptide Catalyst

**Significance:** The amphiphilic resin-supported peptide 1 catalyzed the regio- and enantioselective transfer hydrogenation of (2E,4E)-α,β,γ,δ-unsaturated aldehydes 2 with a Hantzsch ester to give the corresponding aldehydes 3 in 47–87% yield with 87–99% ee (14 examples, eq. 1).

**Comment:** In the hydrogenation of the mixture of (2E,4E)-2b and (2Z,4E)-2b, aldehyde 3b was obtained in 71% yield with 97% ee (eq. 2). The authors have previously reported the asymmetric transfer hydrogenation of α,β-ununsaturated aldehydes with a Hantzsch ester in the presence of resin-supported peptides (Org. Lett. 2008, 10, 2035; Tetrahedron: Asymmetry 2009, 20, 461).

**Selected examples:**

- **3a** R = H, 79% yield, 99% ee
- **3b** R = NO₂, 75% yield, 97% ee
- **3c** R = Cl, 79% yield, 97% ee
- **3d** R = Br, 71% yield, 98% ee
- **3e** R = OMe, 65% yield, 98% ee
- **3f** 74% yield, 98% ee
- **3g** 71% yield, 98% ee
- **3h** 64% yield, 98% ee
- **3i** 65% yield, 97% ee
- **3j** 47% yield, 97% ee
- **3k** 60% yield, 87% ee
- **3l** 87% yield, dr = 57:43, 93% ee for major diastereomer, 95% ee for minor diastereomer

**Equations:**

1. TFA (20 mol%)

2. DME

3. 10 or 20 °C, 36–60 h

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