Category

Polymer-Supported Synthesis

Key words

aldol reaction

organocatalysis

solvent-free

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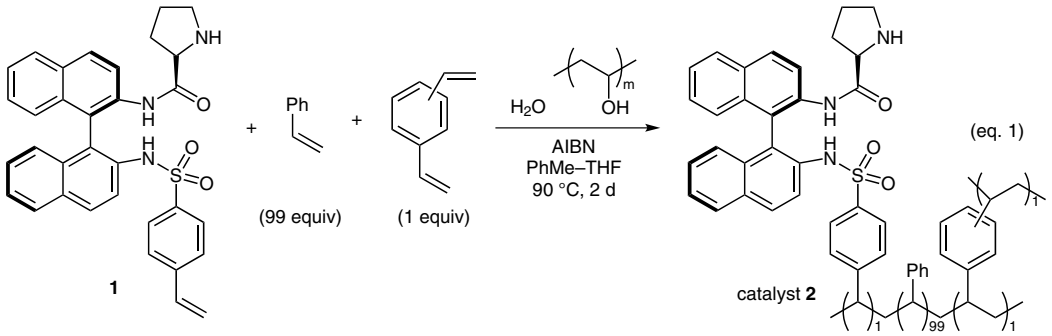
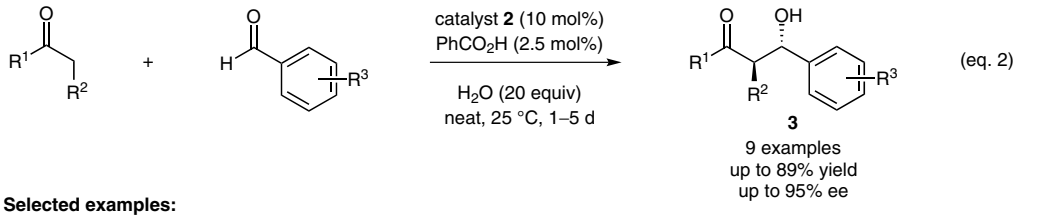
Cross-Linked-Polymer-Supported *N*-{2′-[(Arylsulfonyl)amino][1,1′-binaphthalen]-2-yl}prolinamide as Organocatalyst for the Direct Aldol Intermolecular Reaction under Solvent-Free Conditions

Helv. Chim. Acta **2012**, *95*, 1831–1841.

Asymmetric Aldol Reaction with BINAM-Sulfonyl Polymeric Organocatalyst

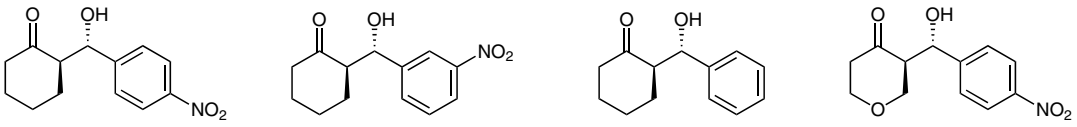




3

9 examples
up to 89% yield
up to 95% ee

Selected examples:

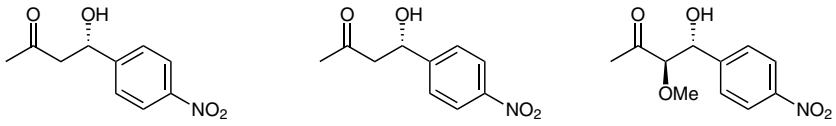


3a 1 d, 88% yield
93% ee, *anti*/*syn* = 89:11

3b 3 d, 82% yield
82% ee, *anti*/*syn* = 73:27

3c 3 d, 74% yield
85% ee, *anti*/*syn* = 60:40

3d 3 d, 69% yield
95% ee, *anti*/*syn* = 85:15



3e[a] 2 d, 83% yield
56% ee
([a] in the absence of H_2O)

3f[a] 5 d, 48% yield
72% ee

3g[a] 3 d, 76% yield
87% ee, *anti*/*syn* = 83:17

Significance: The BINAM-sulfonyl polymeric organocatalyst **2** was prepared by the AIBN-promoted copolymerization of BINAM-derived sulfonamide **1**, styrene, and divinylbenzene (eq. 1). Polymer **2** catalyzed the asymmetric aldol reaction of aliphatic ketones with aromatic aldehydes to give the corresponding aldol products **3** in up to 89% yield with up to 95% ee (9 examples, eq. 2).

Comment: In the aldol reaction of cyclohexanone with 4-nitrobenzaldehyde, the catalyst was recovered by filtration and reused six times with a slight decrease in its catalytic activity (1st reuse: 90% yield, 90% ee, *anti*/*syn* = 87:13, 6th reuse: 77% yield, 92% ee, *anti*/*syn* = 86:16).

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