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Helical Polyisocyanide-Based Macroporous Organic Catalysts for Asymmetric Michael Addition with High Efficiency and Stereoselectivity

Chem. Sci. 2024. 15, 12480-12487, DOI: 10.1039/d4sc01316f.

Asymmetric Michael Addition Catalyzed by a Polyisocyanide-Based Porous Polymer

Significance: A porous polymer bearing chiral secondary amines (C-poly₁₅₀) was prepared by polymerizing the homochiral isocyanide monomer using the four-arm catalyst 4-Pd(II) as the initiator, followed by insertion of the bifunctional isocyanide crosslinker and subsequent removal of the protecting Boc group, according to equation 1. C-poly₁₅₀ promoted asymmetric Michael addition of cycloketones with trans-nitrostyrenes in brine at room temperature to give the syn Michael adducts in up to 86% yield and $dr \le 99:1$ with $\le 99\%$ ee (eq. 2).

Comment: The authors have previously reported linear polymer-catalyzed asymmetric Michael addition reactions (Macromolecules 2018, 51, 9547). In the Michael addition of cyclohexanone with transnitrostyrene, the C-poly₁₅₀ was recovered by centrifugation and reused five times without significant loss of its catalytic activity and stereoselectivity.

SYNFACTS Contributors: Yasuhiro Uozumi, Kaili Zhang Synfacts 2024, 20(11), 1181 Published online: 16.10.2024 DOI: 10.1055/s-0043-1775147; Reg-No.: Y12124SF

Category

Polymer-Supported Synthesis

Key words

asymmetric catalysis Michael addition porous polymers cycloketones trans-nitrostyrenes

