A. PUGLISI,* R. ANNUNZIATA, M. BENAGLIA,* F. COZZI, A. GERVASINI, V. BERTACCHE, M. C. SALA (UNIVERSITÀ DEGLI STUDI DI MILANO, ITALY)

Hybrid Inorganic-Organic Materials Carrying Tertiary Amine and Thiourea Residues Tethered on Mesoporous Silica Nanoparticles: Synthesis, Characterization, and Co-Operative Catalysis

Adv. Synth. Catal. **2009**, 351, 219-229.

Michael Additions Catalyzed by Bifunctional Mesoporous Silica

Category

Polymer-Supported Synthesis

Key words

bifunctional catalysts

thiourea residues

tertiary amines

mesoporous silica

SYNFACT
of the month

Significance: The Michael reaction mediated by mesoporous silica-supported amine-urea bifunctional catalysts is reported in which the tertiary amine and the urea moieties work as a base and an acid, respectively. The reaction of acetone (6) with 2-nitrostyrene (7) was carried out with bifunctional catalyst 1 (amine/urea = 53:47) under conditions A to give 3-[1-(1-phenyl-2-nitroethyl)]-2,4-pentadione (8) in 80% yield. When catalysts 2-5 were used, product 8 was obtained in 0-56% yield. Catalyst 1 was reused three times under conditions B to afford product 8 in high yields.

Comment: The reaction of Cbz-benzaldimine (9) and 6 with catalyst 1 in toluene was also performed to afford product 10 in 83% yield. Catalysts 1-5 were prepared in accordance to the previously reported procedure (V. S.-Y. Lin and co-workers *Angew. Chem. Int. Ed.* **2005**, 44, 1826). Enantioselective Michael addition of malonates to nitroolefins using bifunctional organocatalysts was reported by Takemoto and co-workers (*J. Am. Chem. Soc.* **2003**, 125, 12672).

SYNFACTS Contributors: Yasuhiro Uozumi, Yoichi M. A. Yamada, Toshihiro Watanabe
Synfacts 2009, 4, 0451-0451 Published online: 23.03.2009
DOI: 10.1055/s-0028-1087854; Reg-No.: Y01709SF

2009 © THIEME STUTTGART • NEW YORK

451