Aerobic Oxidation of Alcohols with MoS2/Ta3N5 Nanocomposites

Significance: Ta3N5 nanoparticles partly coated with a MoS2 layer (MoS2/Ta3N5 NPs) were prepared by hydrothermal treatment of Ta3N5 NPs with (NH4)6Mo7O24 in the presence of thiourea (eq. 1). MoS2/Ta3N5 NPs catalyzed the aerobic oxidation of alcohols under oxygen (1 atm) to give the corresponding aldehydes or ketones in up to 99% conversion with 99% selectivity (13 examples, eq. 2).

Comment: MoS2/Ta3N5 NPs were characterized by SEM, TEM, XRD, ICP-AES and elemental analysis. The catalyst also promoted the aerobic oxidation of amines, sulfides, and alkenes to afford the corresponding imines, sulfoxides, and epoxides (eq. 3). In the oxidation of benzyl alcohol, the catalytic activity of MoS2/Ta3N5 NPs was superior to that of Ta3N5 NPs and MoS2.

SYNFACTS Contributors: Yasuhiro Uozumi, Hiroaki Tsuji

SYNFACTS 2013, 9(2), 0221 Published online: 18.01.2013
DOI: 10.1055/s-0032-1318049; Reg-No.: Y15112SF