Silane Oxidation Catalyzed by Carbon Nanotube–Gold Nanohybrids

Significance: The gold nanohybrids on multiwalled carbon nanotubes 1 (AuCNT nanohybrids) were prepared by layer-by-layer (LBL) assembly of amphiphilic nitrilotriacetic acid diyne lipids (DANTA), cationic poly(diallyldimethylammonium chloride) (PDA-DMAC), and colloidal nanoparticles (AuNPs). The AuCNT-catalyzed aerobic oxidation of silanes (2a–j) was carried out in THF to give the corresponding silanols (3a–j) in 93–99% yields.

Comment: The hydrophobic portion of DANTA was adsorbed on the nanotubes and photopolymerized by UV irradiation at 254 nm. Carbon nanotube–gold nanohybrid 1 was characterized by TEM, GC-MS, ICP-MS, and XPS analyses. The catalyst was readily recovered by centrifugation and reused five times without significant loss of catalytic activity.