Silane Oxidation Catalyzed by Carbon Nanotube–Gold Nanohybrids

Significance: The gold nanohybrid on multiwalled carbon nanotubes \( 1 \) (AuCNT nanohybrids) was prepared by layer-by-layer (LBL) assembly of amphiphilic nitrotriacetic 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.