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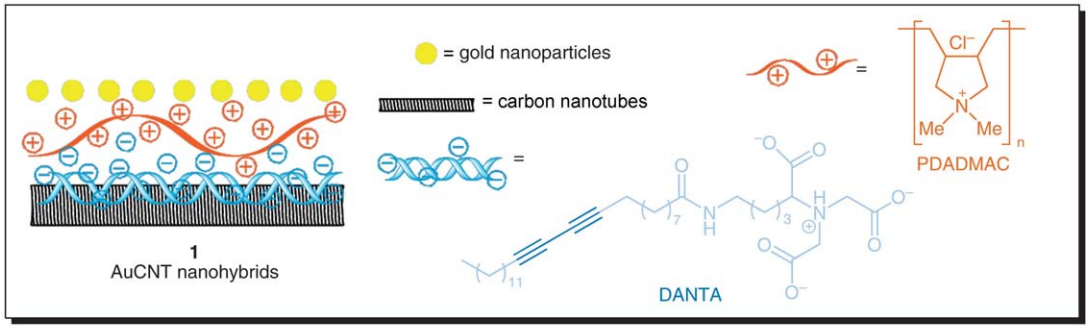
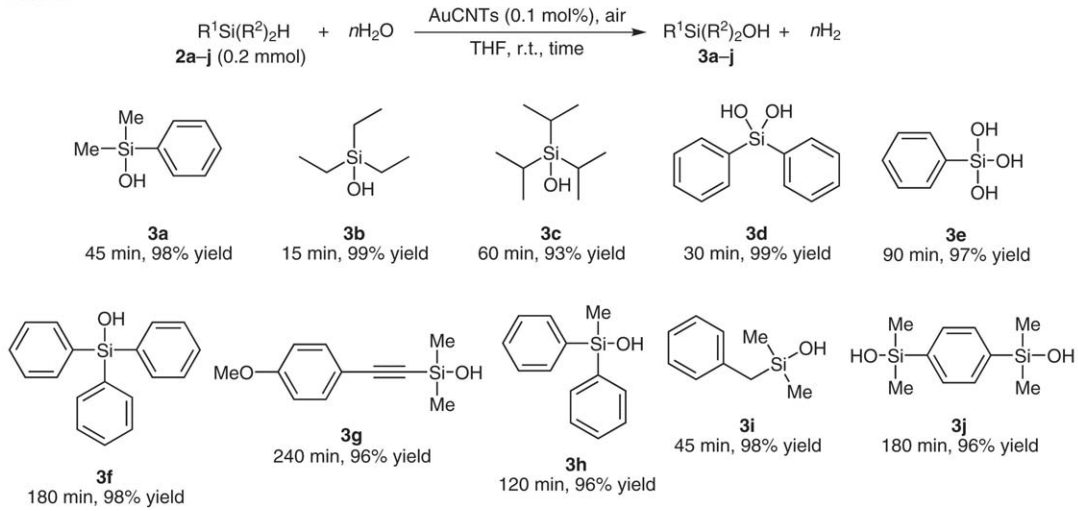
Catalytic Oxidation of Silanes by Carbon Nanotube–Gold Nanohybrids
Angew. Chem. Int. Ed. **2011**, *50*, 7533-7536.

Silane Oxidation Catalyzed by Carbon Nanotube–Gold Nanohybrids



Results:



Significance: The gold nanohybrid on multiwalled carbon nanotubes **1** (AuCNT nanohybrids) was 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.

SYNFACTS Contributors: Yasuhiro Uozumi, Yoichi M. A. Yamada, Heeyoel Baek
Synfacts 2011, 11, 1249-1249 Published online: 19.10.2011
DOI: 10.1055/s-0031-1289248; **Reg-No.:** Y12011SF

Category
Polymer-Supported Synthesis

Key words
carbon nanotubes
oxidation
heterogeneous catalysis
layer-by-layer