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Low Temperature Oxidation of Methane on Gold Nanoparticles

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This paper focuses on the catalytic properties of gold nanoparticles supported on carbon amorphous for low-temperature methane oxidation (1 bar 20-90 degree Celsius). The oxidation was realized in the mixture that containing (vol %) 5% CO, 10% CO2, 1.5% C2H4, 1.5 C2H6 and 2% CH4. The analysis was performed online via a Varian GC 3300 chromatograph using a manual sampling valve, CTRI column (Alltech), TCD, and helium carrier gas. The species of CO and H2 can easily be oxidized even if partial methane oxidation has occurred early in the reaction. The gold nanoparticles and catalyst were characterized using X-ray analysis (DRX), scanning electron microscopy (SEM), high resolution transmission electron microscopy (HR-TEM) and atomic force microscopy (AFM).

Recent Publications

1. Mihai S, Cursaru L. D, Ghita D, Dinescu A (2016) Morpho ierarhic TiO_2 with plasmonic gold decoration for highly active photocatalysis properties, MaterLett., 162:222-225.
2. Mihai S (2013) Synthesis of Gold Nanoparticles Using Schiff Base, Acta Phys. Pol A, 123:254-255.
3. Sun B, Feng X, Yao Y, Su Q, Ji W, Au CT (2013) Substantial Pretratament Effect on CO Oxidation over Controllably Synthesized Au/FeOx Hollow Nanostructures via Hybrid Au/β-FeOOH@SiO2. 3:3099-3105.
4. Zeng L, Li K, Wang H, Yu H, Wei Y, Ning P, Shi C, Luo Y (2017) CO Oxidation on Au/α-Fe2O3-Hollow Catalysts: General Synthesis and Structural Dependence. J. Phys. Chem. C. 121:12696-12710.
5. Moreau F, Bond G,Hughes R, Moulijn JA, Makkee M, Krishna K, Silberova BAA (2007) Preparation of a Monolith-Supported Au/TiO2 Catalyst Active for CO Oxidation. Gold Bulletin 40:291-294.

Biography

Mihai Sonia is associate professor at the Petroleum-Gas University of Ploiesti, Chemistry department received her PhD degree in chemistry at University of Bucharest in 2010 and post-doctoral studies at the Petroleum-Gas University in 2013. Her current research works focus on the synthesis and characterization gold nanoparticles and their applications, catalysts, photocatalysis, detection SERS-Raman and aqueous corrosion studies.

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