

Gold Nanoparticles Supported Cs_2CO_3 as a Simple and Recyclable Catalyst System for Selective Aerobic Oxidation of Alcohols at Room Temperature

Babak Karimi*, Farhad Kabiri Esfahani

Department of Chemistry, Institute for Advanced Studies in Basic Sciences (IASBS),
P.O.Box 45195-1159, Gava Zang, Zanjan, Iran

Fax: (+98) 241-4249023; E-mail: karimi@iasbs.ac.ir

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Experimental Procedure

General experimental procedure for oxidation using molecular oxygen or air:

Oxidation of Primary and Secondary Alcohols (Method A):

In a schlenk flask equipped with a condenser and magnetic stirrer bar, the alcohol (1 mmol), was mixed with NaAuCl₄ (0.0008 g, 0.2 mol %), Cs₂CO₃ (0.978 g, 3 mmol) in toluene (8 mL). The flask was then evacuated and refilled with pure oxygen or air for three times (balloon filled). The resulting mixture was stirred at 30 °C under an oxygen or air atmosphere (for the indicated time in the Table 1). The progress of the reaction was monitored by GC. After completion of the reaction, the reaction mixture was filtered off and the catalyst rinsed three times with Et₂O (3 × 25 mL) the excess of solvent was removed under reduced pressure to give the corresponding carbonyl compounds (Table 1). In most cases, the purity of products was analyzed by GC to be more than 99% without any chromatographic purification.

Oxidation of Primary and Secondary Alcohols (Method B):

In a schlenk flask equipped with a condenser and magnetic stirrer bar, the alcohol (1 mmol), was mixed with NaAuCl₄ (0.0008 g, 0.2 mol %), Cs₂CO₃ (0.978 g, 3 mmol), *n*-Bu₄NBr (0.0032 g, ~ 1 mol %) in toluene (8 mL). The flask was then evacuated and refilled with pure oxygen or air for three times (balloon filled). The resulting mixture was stirred at 30 °C under an oxygen or air atmosphere (for the indicated time in the Table 1). The progress of the reaction was monitored by GC. After completion of the reaction, the reaction mixture was filtered off and the catalyst rinsed three times with Et₂O (3 × 25 mL) the excess of solvent was removed under reduced pressure to give the corresponding carbonyl compounds (Table 1). In most cases, the purity of products was analyzed by GC to be more than 99% without any chromatographic purification.

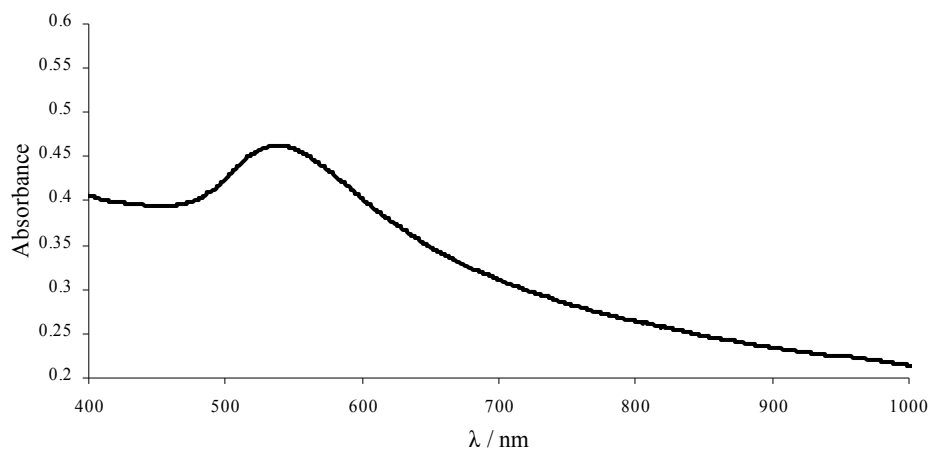


Figure 1S. DR-UV spectrum of the recovered catalysts (Au/Cs₂CO₃ matrix).

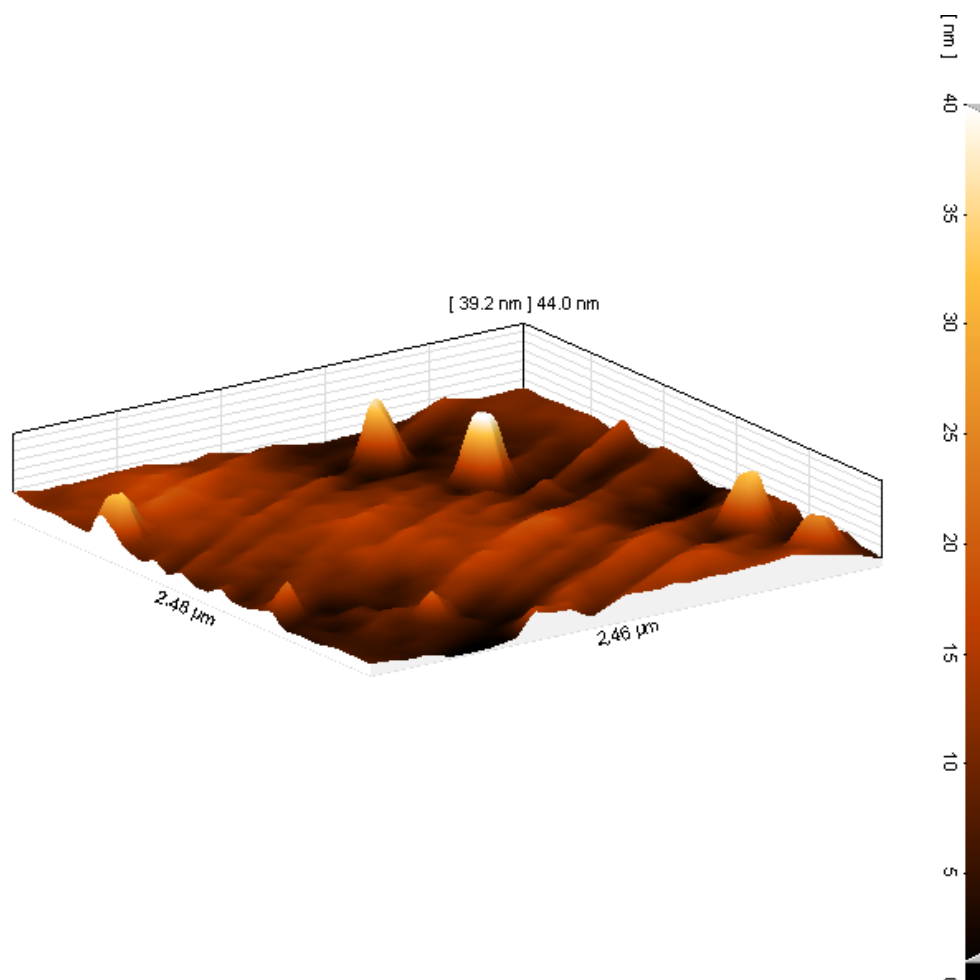


Figure 2S. AFM image of the recovered catalysts (Au/Cs₂CO₃ matrix).

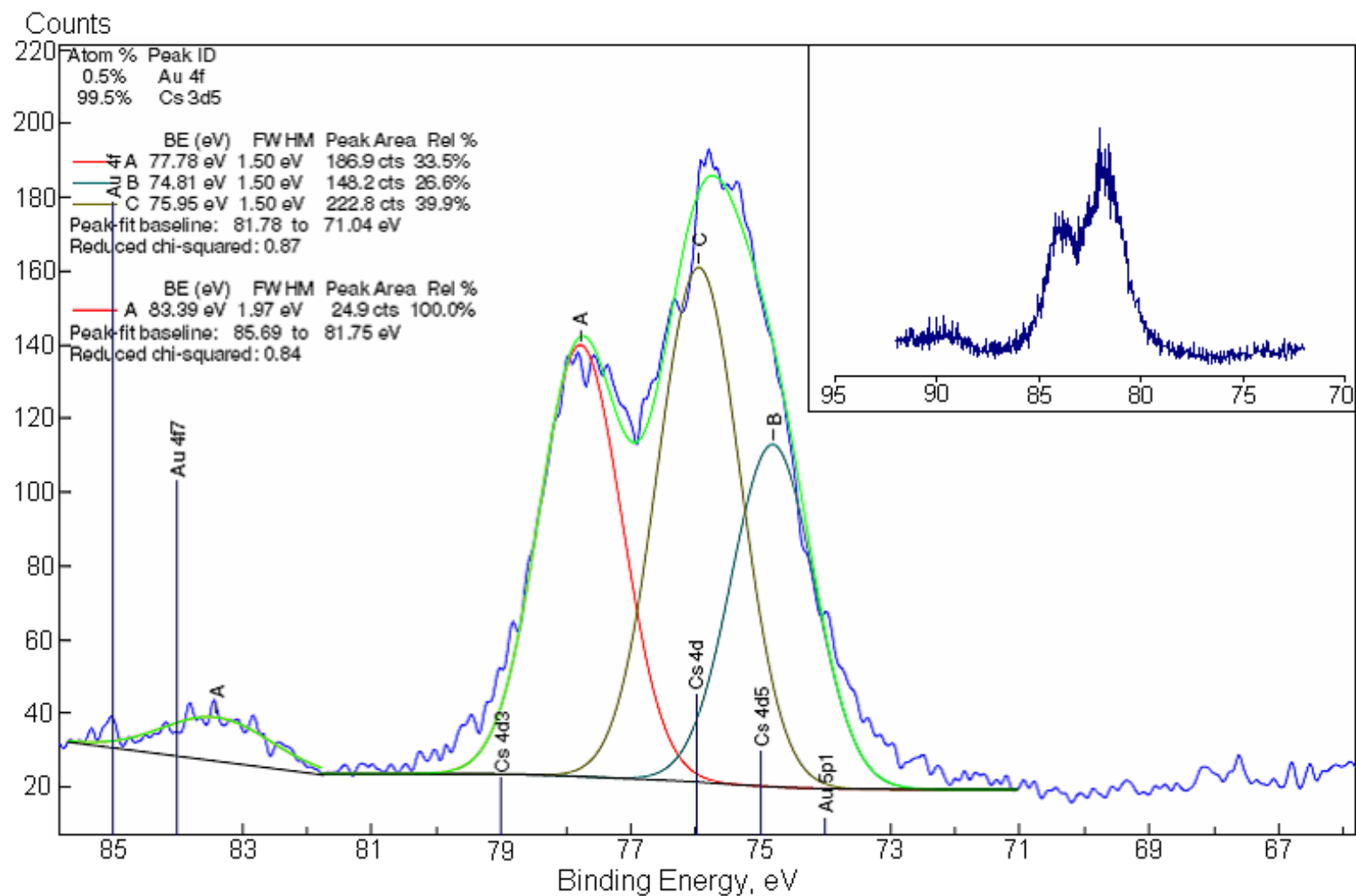


Figure 3S. X-ray photoelectron spectra of Au/Cs₂CO₃ matrix

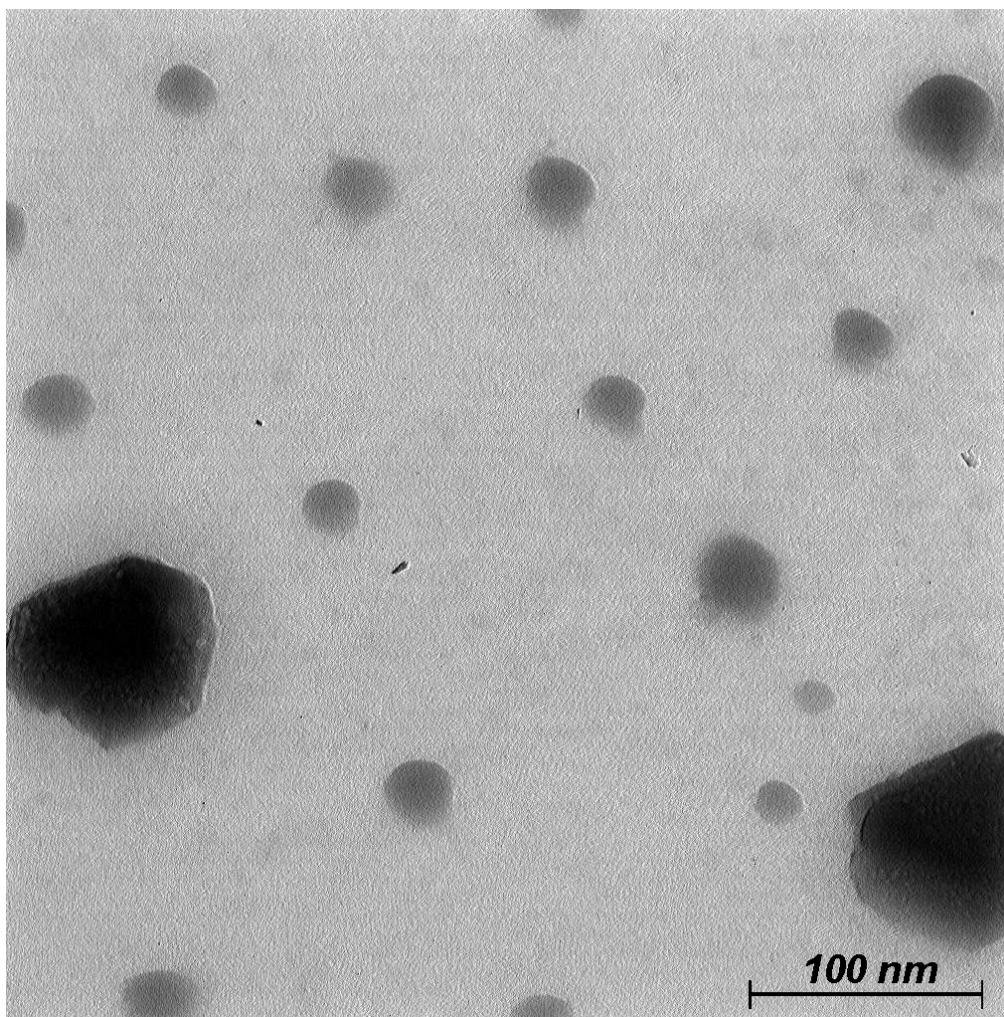


Figure 4S. TEM image of the Au/Cs₂CO₃ after recovery