

Supplementary Information

Exploration of active sites of ethyl alcohol electro-oxidation on porous gold nanoparticles with enhanced Raman spectroscopy

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Materials and Characterizations

HAuCl₄•3H₂O (≥98%), 0.05 μm alumina polishing powder, Nafion (5%), potassium ferricyanide, potassium chloride was purchased from Aladdin (Shanghai, China). Urea and ethanol were purchased from Shantou Xilong and Tianjin Fuchen. All aqueous solutions were prepared by deionized water (18.25 MΩ·cm). Transmission electron microscope (TEM) images were captured using a transmission electron microscope (S-4800, Japan). The Q-switched YAG laser (Indi-10) from American Spectral Physics Corporation was used for laser irradiation. The laser beam was focused using a neutral density filter and a quartz converging lens with a focal length of 100mm. An imaging lens with a focal length of 70 mm and an optical fiber probe were used to collect the laser signal. The two-dimensional electric translation table was used to move the experimental samples at a precise speed to ensure the sampling quantity and randomness. Sampling and analysis were performed using grating spectrometer, ICCD and computer. Raman spectroscopy of anhydrous ethanol was detected by self-assembled Raman spectrometer and electrochemical detection of porous Au nanospheres was carried out by electrochemical workstation (CHI660E, Shanghai Chenhua Instrument). Renishaw inVia with a laser wavelength of 532nm was used for electrochemical enhanced Raman instrument test various substances in the preparation process are dispersed by ultrasonic cleaner.

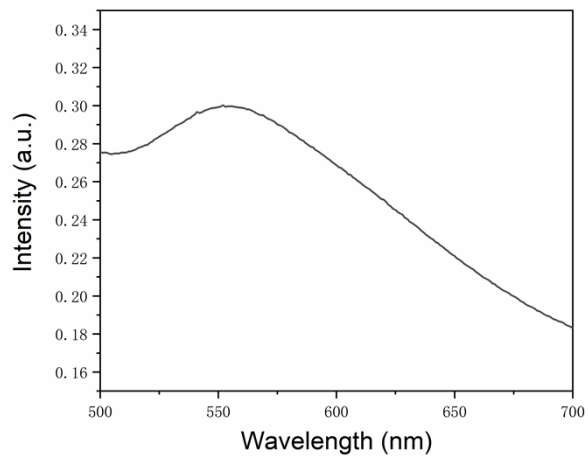


Figure S1 : Ultraviolet absorption spectra of porous gold nanospheres

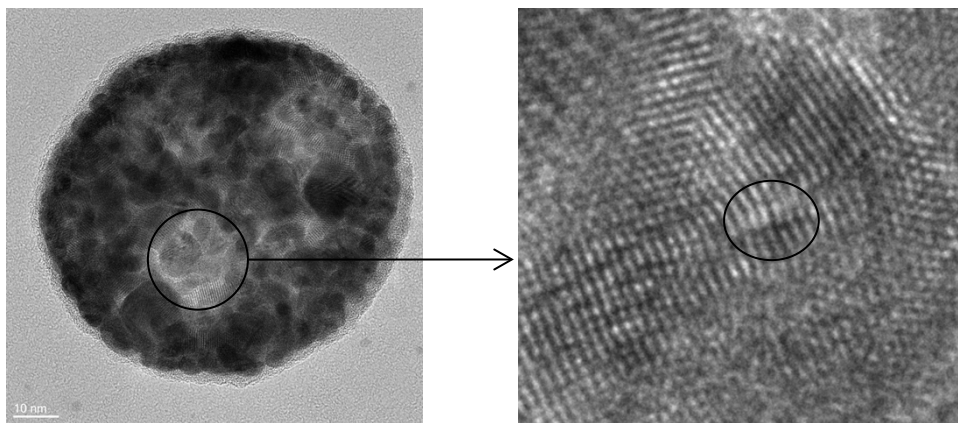


Figure S2 : TEM image of porous gold nanospheres