

Electronic Supplementary Information

Gold Nanoparticles Supported on Layered TiO₂–RGO

Hybrid as an Enhanced and Recyclable Catalyst for

Microwave-assisted Hydration Reaction

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1. Preparation of the Controlling Catalysts

Preparation of Au–RGO. 240 mg GO was dispersed in 100 mL isopropanol by sonication for 1 h, and the mixture was kept stirring for another 2 h. 0.5 g glucose and 0.5 g sodium citrate were added into the suspension. After sonication for another 5 min, 1.8 mL chloroauric acid (HAuCl_4) (0.02 M) was added to this mixture, and it was stirred for 4 h at room temperature. The resulting mixture was centrifugated and washed with deionized water three times, followed by freeze-drying.

Preparation of Au–TiO₂. To prepare TiO₂, 3 mL tetrabutyl titanate was dispersed in 100 mL isopropanol by sonication for 1 h. Subsequently, 3 mL deionized water was added dropwise, and the mixture was kept stirring for another 2 h. The solution was then transferred into a 150 mL Teflon-lined stainless steel autoclave and heated at 180 °C for 8 h. The as-prepared TiO₂ was purified by centrifugation and washing with ethanol and deionized water three times and then dispersed in 100 mL deionized water with sonication for 0.5 h. To prepare Au deposited on TiO₂ (Au–TiO₂), 0.5 g glucose and 0.5 g sodium citrate were added into the suspension. After sonication for another 5 min, 0.5 mL chloroauric acid (HAuCl_4) (0.02 M) was added to this mixture, and it was stirred for 4 h at room temperature. The resulting mixture was centrifugated and washed with deionized water three times, followed by freeze-drying.

Preparation of Au–TiO₂–RGO-1. Au–TiO₂–RGO-1 was prepared by the same method as Au–TiO₂–RGO only with different HAuCl_4 addition (3.5 mL, 0.02 M).

Preparation of Au–TiO₂–RGO-2. Au–TiO₂–RGO-2 was prepared by the same method as Au–TiO₂–RGO only with different HAuCl_4 addition (1.0 mL, 0.02 M).

2. Supplementary Figure

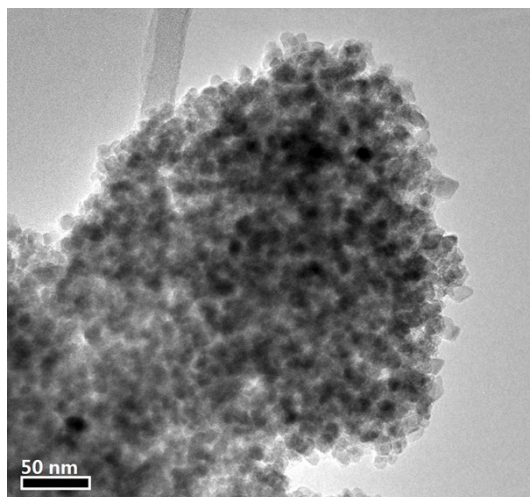


Figure S1. TEM spectrum of Au-TiO₂.

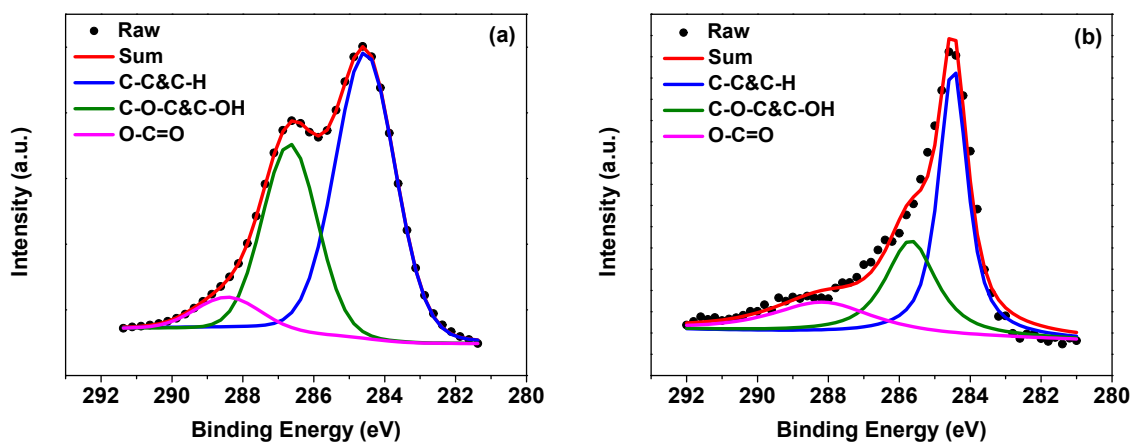


Figure S2. C 1s XPS spectra of (a) GO and (b) Au-TiO₂-RGO.

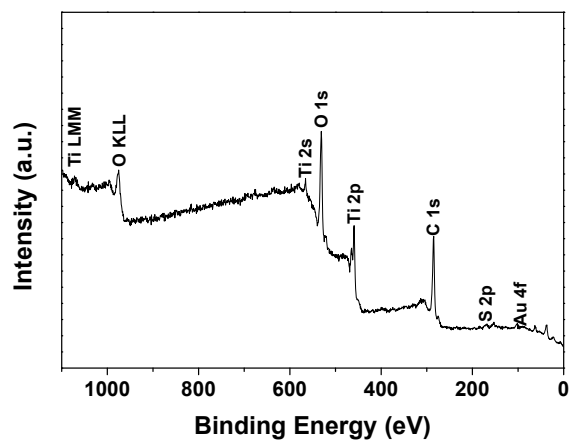


Figure S3. Full range XPS spectrum of Au-SO₄²⁻/TiO₂-RGO after 5 cycles.