

Electronic Supplementary Information

Surface clean gold nanoflower obtained by complete removal of capping agent: active catalyst for alcohol oxidation

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TEM-EDX measurement: TEM-EDX spectra of Au NFs indicated that they were composed of pure gold. The Cu was from the TEM copper grid.

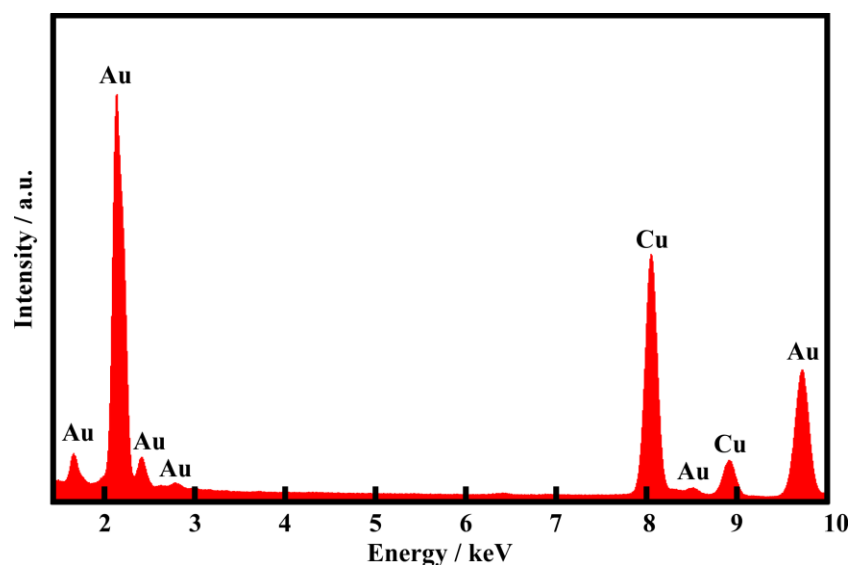


Figure S1. TEM-EDX spectra of Au NFs.

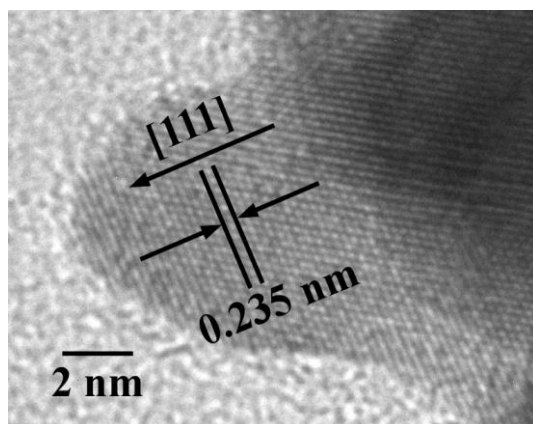


Figure S2. HR-TEM image of Au NFs.

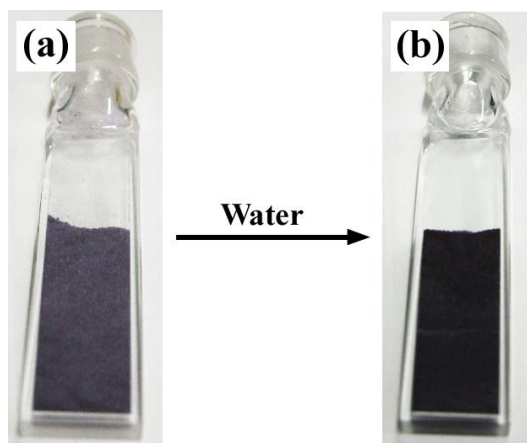


Figure S3. Photographic images of (a) dry and (b) wet powders of Au NFs/ γ -Al₂O₃.

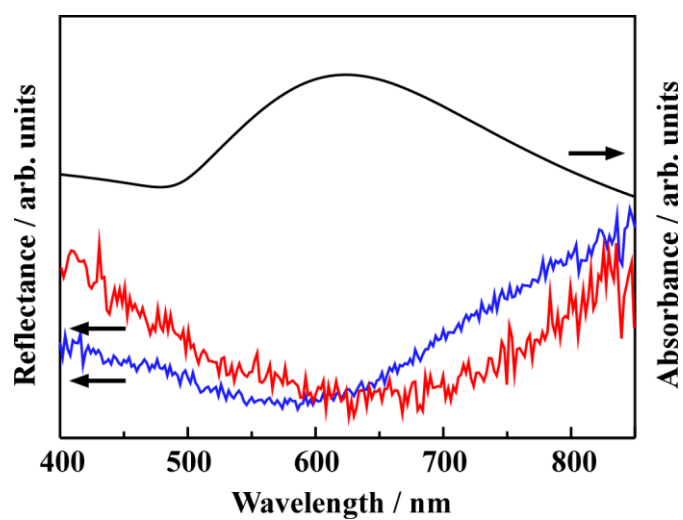


Figure S4. UV-vis absorption spectra of Au NFs dispersion (black line). UV-vis reflectance spectra of dry (blue line) and wet (red line) powders of Au NFs/ γ -Al₂O₃, shown in Figure S3.

TG-DTA measurement: TG-DTA measurement was conducted using a SII TG/DTA 7200 instrument. The sample was heated from room temperature to 800°C at a rate of 10°C/min under a flow of air. The amounts of melamine was 1.4 mg.

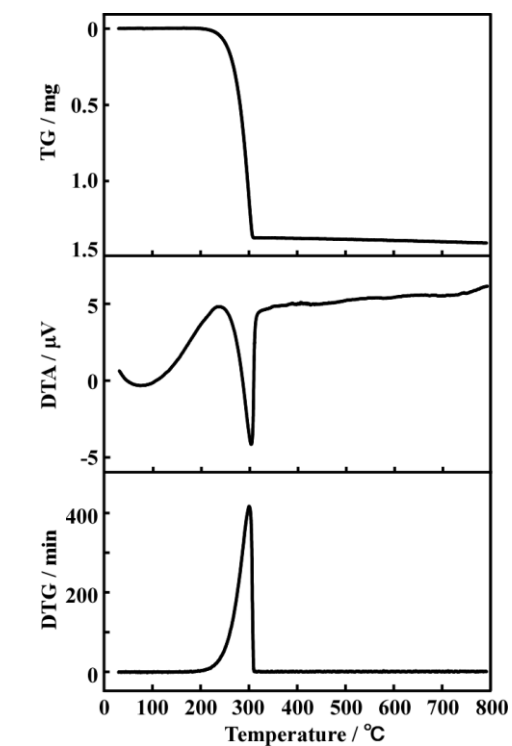


Figure S5. TG-DTA measurement of melamine.

Calcination Procedure

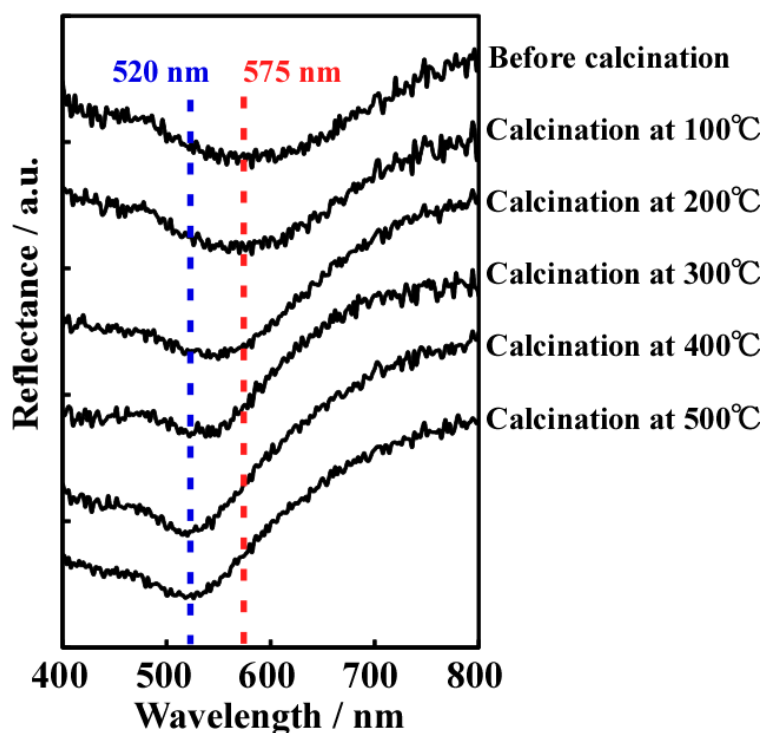


Figure S6. UV-vis reflectance spectra before and after calcination of Au NFs/ γ -Al₂O₃. Red and blue dotted lines show 575 and 520 nm, respectively.

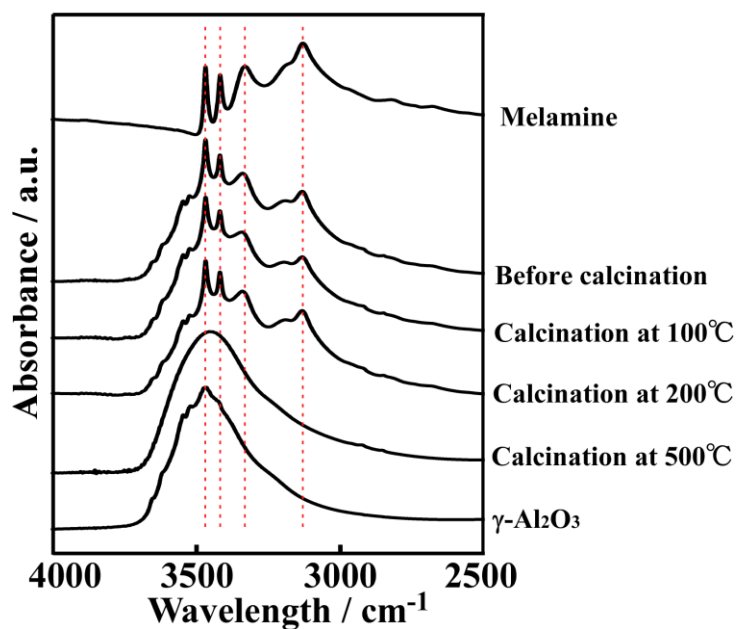


Figure S7. FT-IR spectra before and after calcination of Au NFs/ γ -Al₂O₃. Red dotted lines represent melamine.

Melamine^[1,2]

3469 cm⁻¹: NH₂ asymmetric stretching, 3418 cm⁻¹: NH₂ asymmetric stretching,

3328 cm⁻¹: NH₂ symmetric stretching, 3128 cm⁻¹: N-H...N stretching

Water extraction procedure

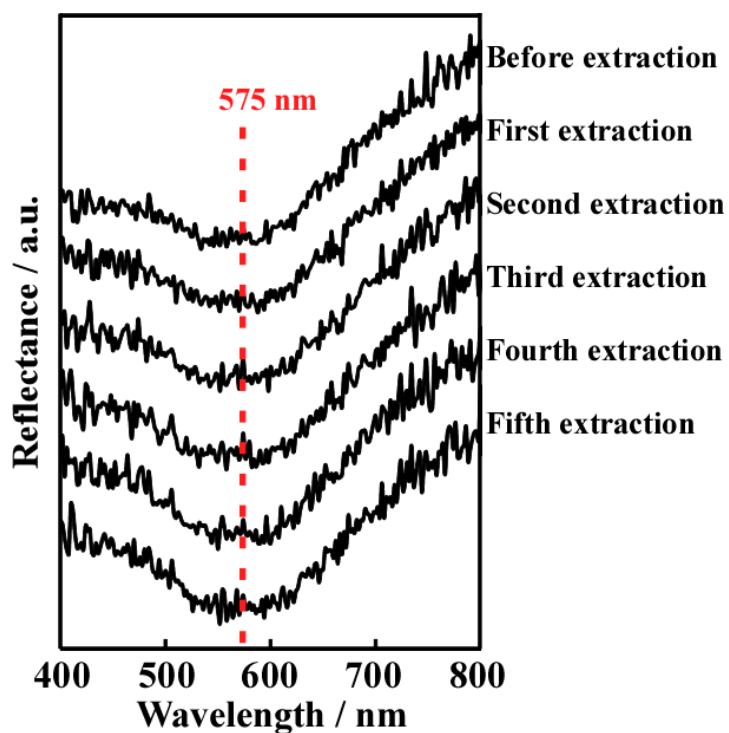


Figure S8. UV-vis spectra of Au NFs/ γ -Al₂O₃ before and after water extraction procedure. The red dotted line is at 575 nm.

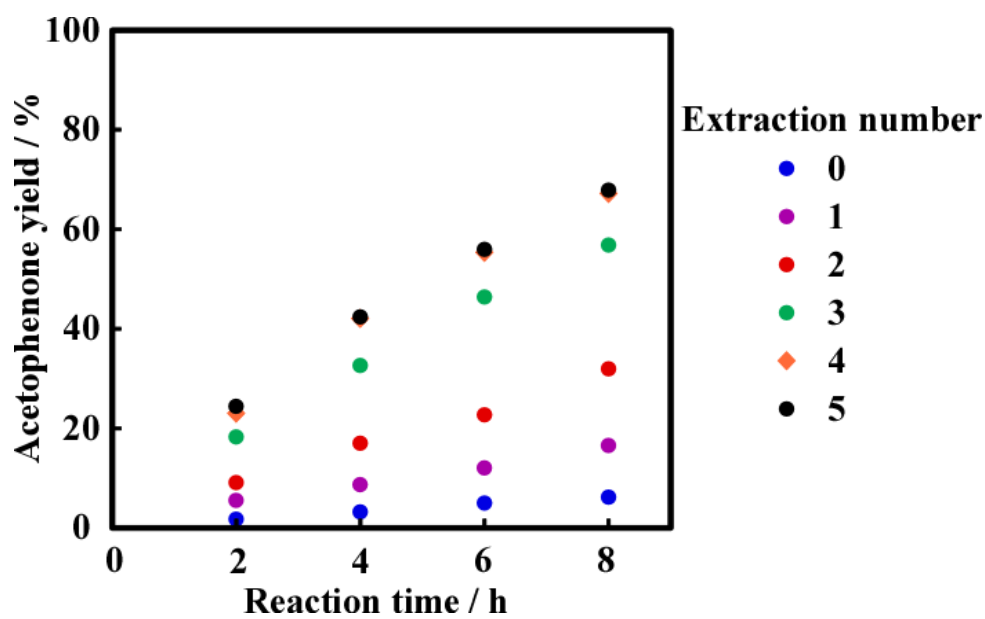


Figure S9. Effect of the number of extractions on acetophenone yield.

Table S1. Catalytic performance of Au NFs/ γ -Al₂O₃ before and after extraction in oxidation of 1-phenylethyl alcohol.

Number of extractions	1-PA conversion / %	AP yield / mol%
0	10	6
1	22	17
2	36	32
3	61	57
4	70	67
5	72	68

Reaction conditions: 1-phenylethyl alcohol (15 μ mol), catalyst (50 mg), K₂CO₃ (0.1 g), water (10 g), Air (1 atm), 60°C, 8 h.

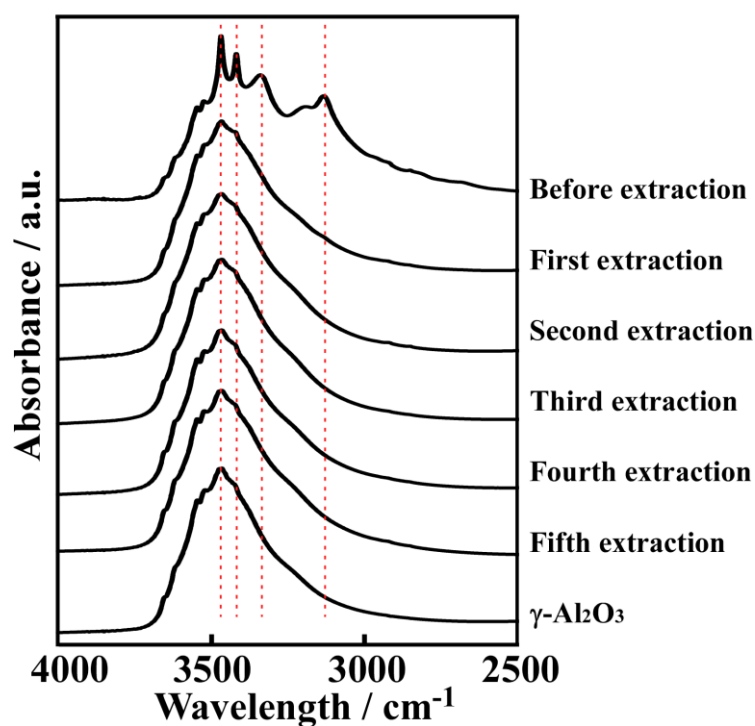


Figure S10. FT-IR spectra of Au NFs before and after water extraction procedure. Red dotted lines represent melamine.

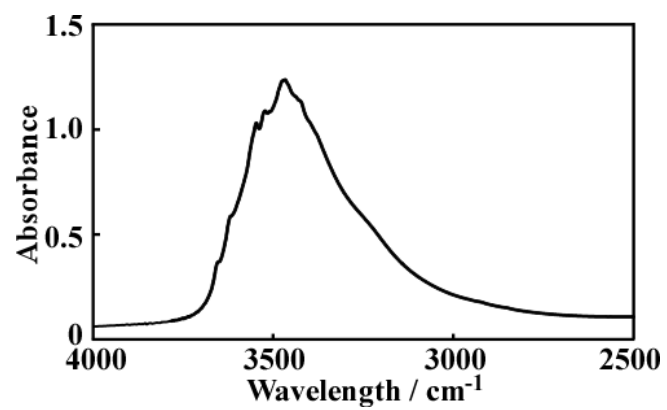


Figure S11. FT-IR spectra of Au NPs after heating washed Au NFs.

Reference

[1] M. K. Marchewka, *Mater. Sci. Eng. B* 2002, **95**, 214-221.

[2] W. J. Jones, W. J. Orville-Thomas, *Trans. Faraday Soc.* 1959, **55**, 203-210.