

Electronic Supplementary Information

Cucurbit[7]uril-stabilized gold nanoparticles as catalysts of nitro compounds reduction reaction

E. Blanco,^a I. Esteve-Adell,^b P. Atienzar,^b J.A. Casas,^c P. Hernández,^a and C. Quintana^a

^a Departamento de Química Analítica y Análisis Instrumental, Universidad Autónoma de Madrid. Cantoblanco, 28049 Madrid, Spain. Fax: +34 91 4974931; Tel: +34 91 4977626.

^b Instituto Universitario de Tecnología Química CSIC-UPV and Departamento de Química, Universidad Politécnica de Valencia, 46022 Valencia, Spain.

^c Departamento de Química Física Aplicada, Universidad Autónoma de Madrid. Cantoblanco, 28049 Madrid, Spain.

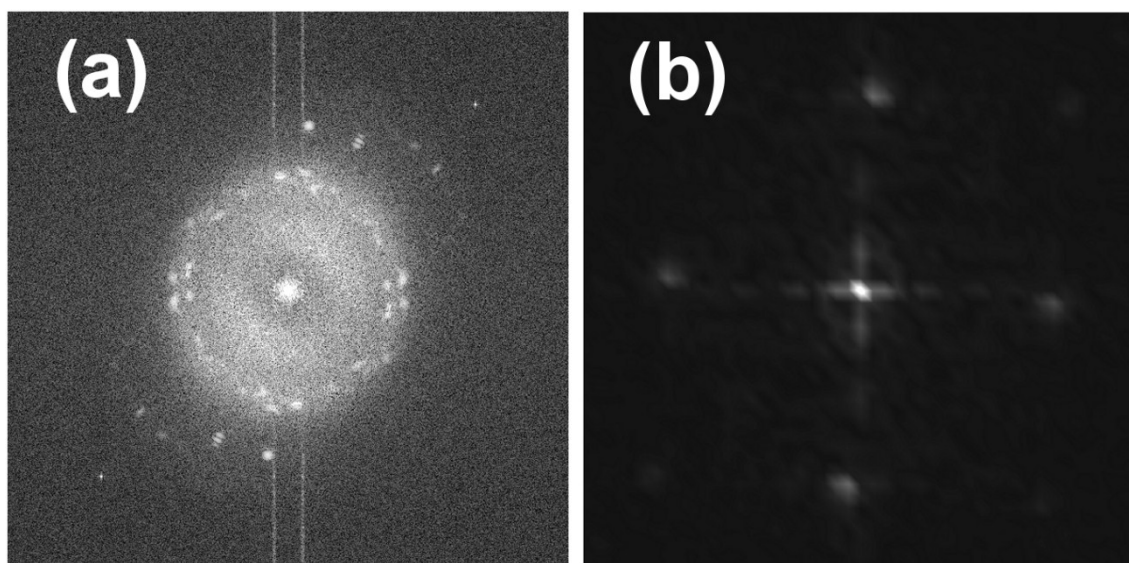


Fig. S1 (a) Selected Area Electron Diffraction (SAED) pattern of a gold nanocrystal. (b) Image obtained after application of 2D-Fast Fourier Transform (2D-FFT) in the marked area of Fig. 1(c).

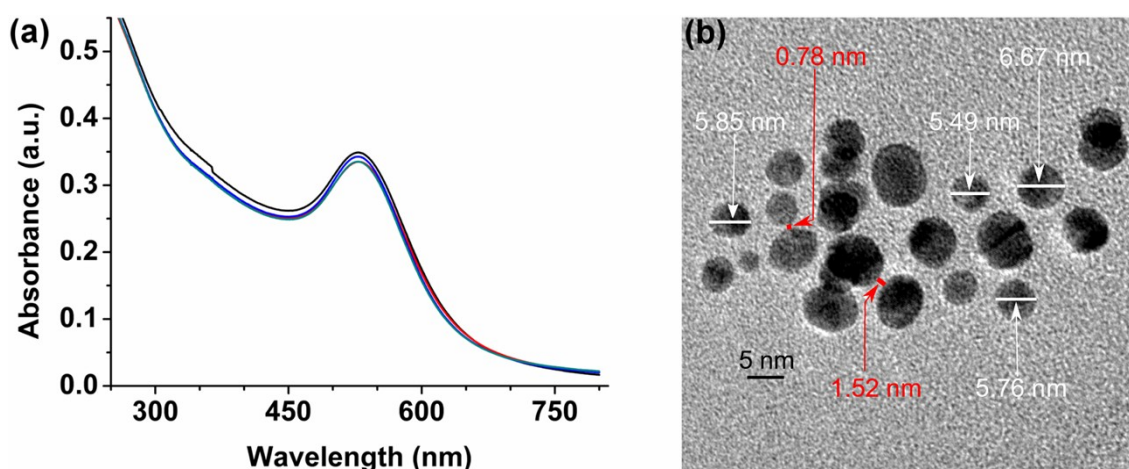


Fig. S2 (a) UV-Vis spectra of the gold suspension just after the synthesis (black) and after 1 (red), 2 (blue) and 3 (green) months. (b) HR-TEM image of 3 months aged AuNPs.

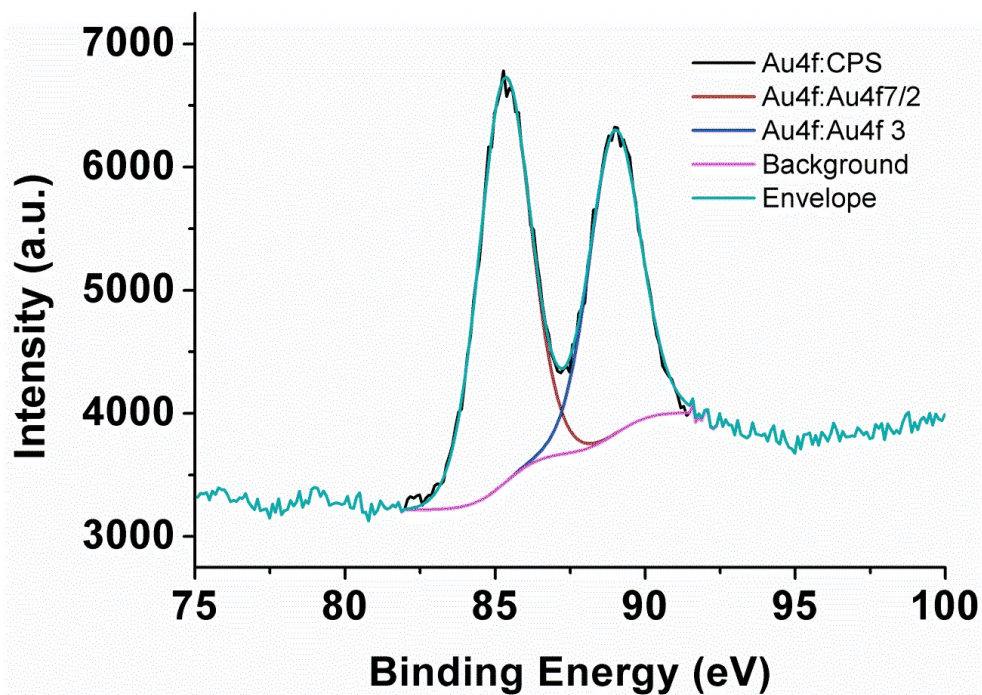


Fig. S3 XPS spectrum of the synthesised AuNPs.

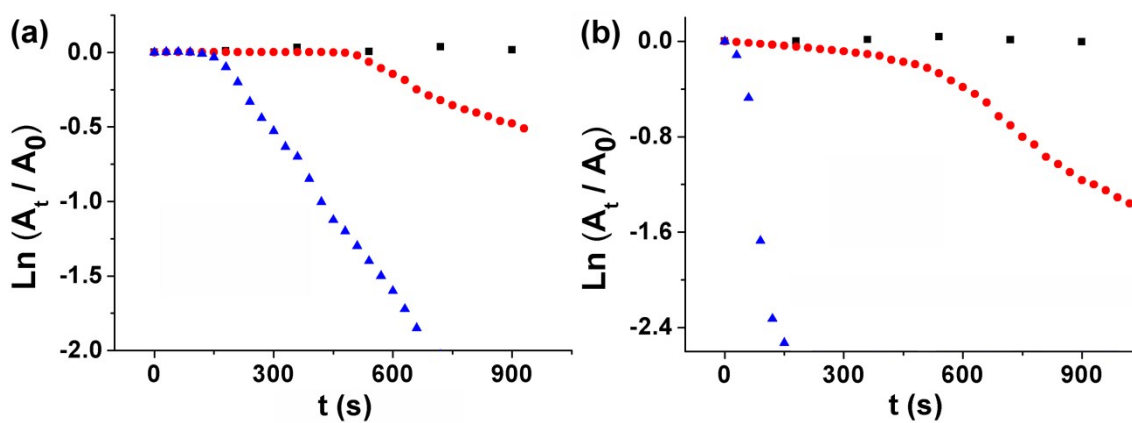


Fig. S4 $\ln(A_t/A_0)$ vs time plots for the reduction of 4-NP (a) and NF (b) at different catalyst volumes: 0 (squares), 25 (circles) and 50 μL (triangles).

Table S1. Comparative table of the apparent kinetic constants obtained for several gold nanosystems (except where indicated) in the 4-NP reduction reaction.

Metal catalyst support or stabilizing agent	T (°C)	NP diameter (nm)	% M(0)/nitro	NaBH ₄ /4-NP	k _{app} (s ⁻¹)	k _{app} (L m ⁻² s ⁻¹)	Ref.
CB7	25	5.7	2.4	100	1.4×10 ⁻³	1.2×10 ⁻¹	1
CB7*	-	2.4	332	44	2.1×10 ⁻²	7.7×10 ⁻³	2
NaBH ₄	-	3.2	0.27	100	9.0×10 ⁻³	3.6×10 ⁻¹	3
1,2,3-triazoles	20	6	0.2	80	1.4×10 ⁻²	4.3×10 ⁻²	4
Mesoporous and oriented boehmite films	25	15-40	280	100	1.7×10 ⁻³	2.7×10 ⁻³	5
Graphene	RT	14.6	45	70	3.2×10 ⁻³	1.9×10 ⁻²	6
Silica nanotubes	RT	3-5	30	42	1.1×10 ⁻²	4.2×10 ⁻²	7
Thermoresponsive micelles	25	3.3	20	33	1.5×10 ⁻³	3.7×10 ⁻³	8
Covalent organic frameworks	RT	5	45	1600	5.4×10 ⁻³	9.7×10 ⁻³	9

*Pd nanoparticles.

Table S2. Induction times for NF and 4-NP reduction reactions in which the reactants order was varied.

Reactants addition order	Induction time (min)
NaBH ₄ + Au + NF	0
NaBH ₄ + Au + 4-NP	≈1.5
NF + Au + NaBH ₄	≈11.0
4-NP + Au + NaBH ₄	≈8.5
NF + NaBH ₄ + Au	≈6.0
4-NP + NaBH ₄ + Au	≈7.5

References

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