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Completely Green Synthesis of Rose-Shaped Au Nanostructures and Their Catalytic Applications

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Supporting Tables

Table S1. Values of the activity parameter, κ, for various heterogeneous catalysts; the values of κ were obtained by dividing the reaction rate constant by the total weight of used catalyst.

Catalysts	Total weight of used catalyst [mg]	Reaction rate constant (k) [10^{-3} s^{-1}]	k [$s^{-1}g^{-1}$]	Ref.
Smooth-edged Au nanostructures	0.28	1.7	**6.07**	[1]
CuNPs	1	7.11	**7.11**	[2]
PtAu core-shell NPs	0.5	5.92	**11.8**	[3]
Jagged-edged Au nanostructures	0.16	2.18	**13.6**	[1]
Multiply-stacked Au nanostructures	0.26	4.8	**18.5**	[1]
Coffee arabica seed extract stabilized Au nanoparticles	2.76	66.3	**24**	[4]
PtPd bimetallic nanoparticles	0.08	2.31	**28.9**	[5]
CuO nanosheets	0.1	4.58	**45.8**	[6]
Citrate stabilized Au nanoparticles	2.76	140	**50.8**	[4]
Avocado seed extract stabilized Au nanoparticles	0.03	1.55	**51.7**	[7]
Porous and Solid Au nanoparticles	0.05	4.6	**92**	[8]
Poly(diallyldimethylammonium chloride)-stabilized Pt nanoparticles	0.286	30	**105**	[9]
NiAu core-shell nanoparticles	0.06	6.4	**107**	[10]
Porous AuPt microparticles	0.5	55	**110**	[11]
PtAu alloy nanocubes	0.04	5.91	**147.8**	[12]
AgNi Alloy	0.2	31.1	**156**	[13]
Hollow porous Cu particles	0.05	9.3	**186**	[14]
Poly(diallyldimethylammonium chloride)-stabilized Pd nanoparticles	0.292	57	**195**	[9]
Porous and hollow Au nanoparticles	0.05	12.1	**242**	[8]
Rose-shaped Au nanostructures	0.06	17.4	**290**	This work

Supporting Figures

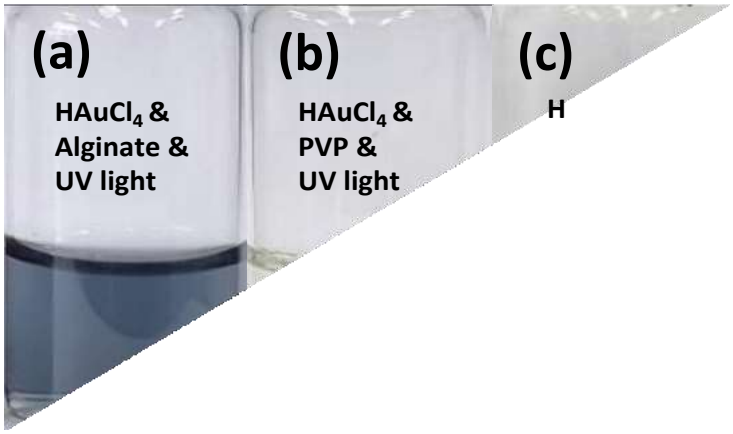

Fig. S1. Photographs of the reaction mixtures without (a) PVP or (b) Na-alginate and aged under UV irradiation for 3 h at room temperature. (c) Photograph of the reaction mixture including Na-alginate and PVP and aged in a dark room for 3 h at room temperature.

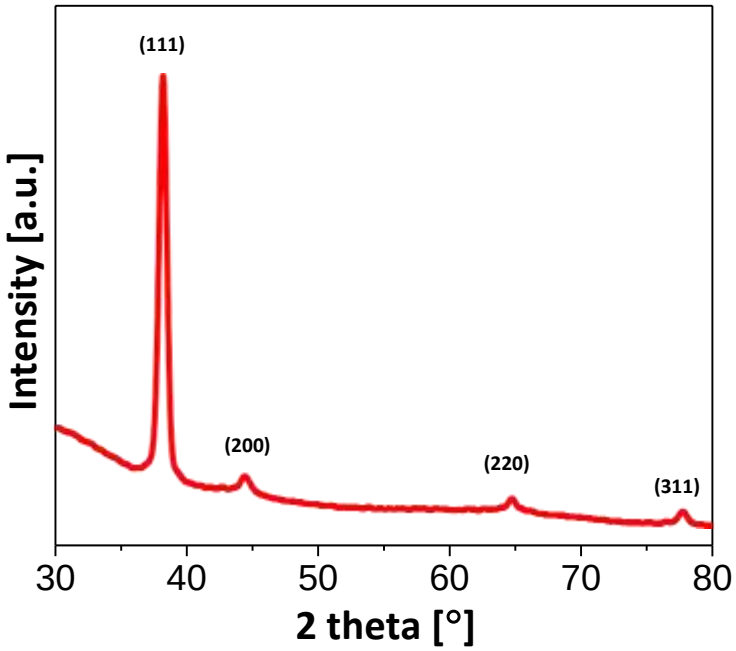

Fig. S2. XRD pattern of the rose-shaped Au nanostructures shown in Fig. 1.

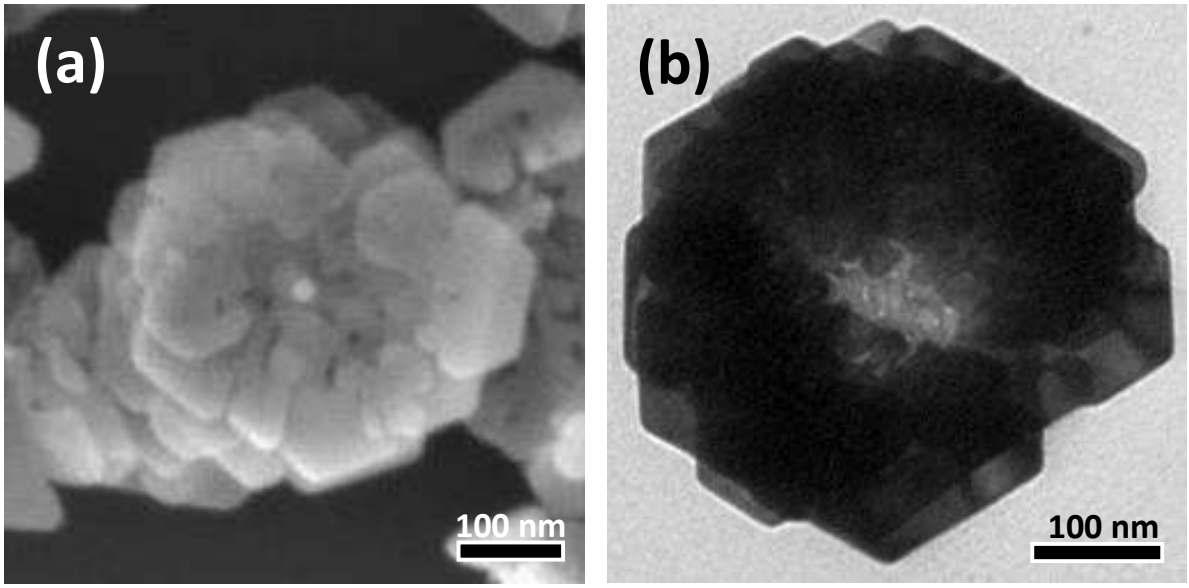

Fig. S3. (a) SEM and (b) TEM images of the rose-shaped Au nanostructures after aging at room temperature over 3 months.

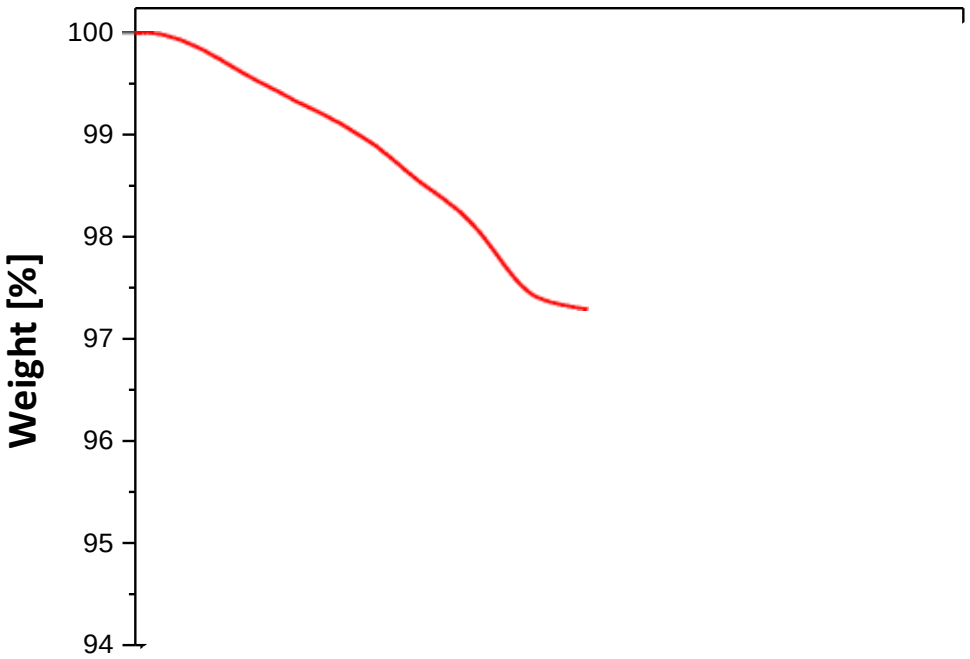

Fig. S4. TGA curve of the rose-shaped Au nanostructures after the complete drying of water.

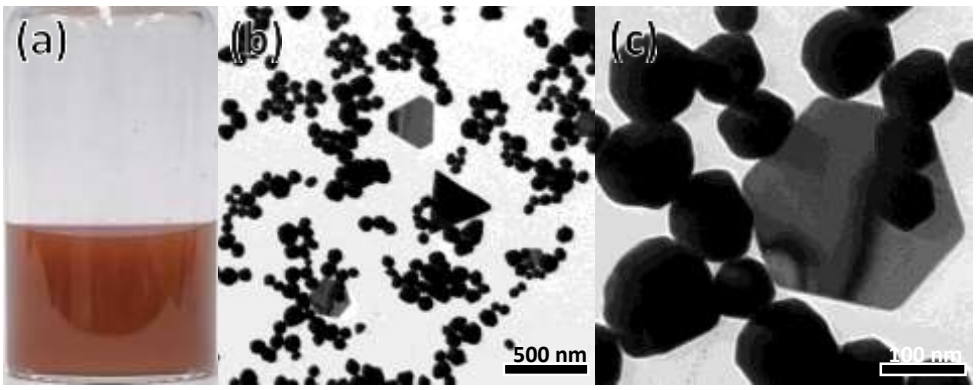

Fig. S5. (a) Photograph of the reaction mixture containing $HAuCl_4$ and PVP but excluding Na-alginate, aged under UV irradiation for 3 h at room temperature. In the reaction, the PVP-to-$HAuCl_4$ weight ratio was approximately 18. (b)–(c) TEM images of the Au nanostructures shown in (a).

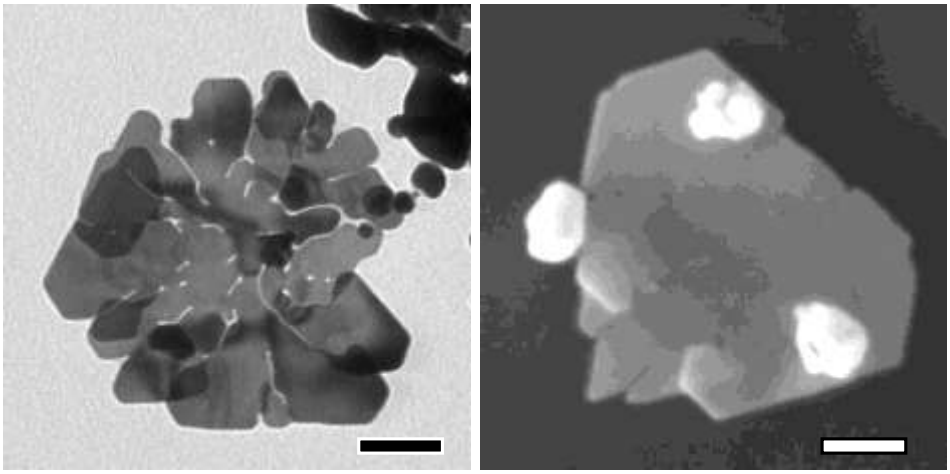

Fig. S6. (a) TEM and (b) SEM images of Au nanostructures grown for 1.5 h under UV irradiation at room temperature. The scale bar indicates 100 nm.

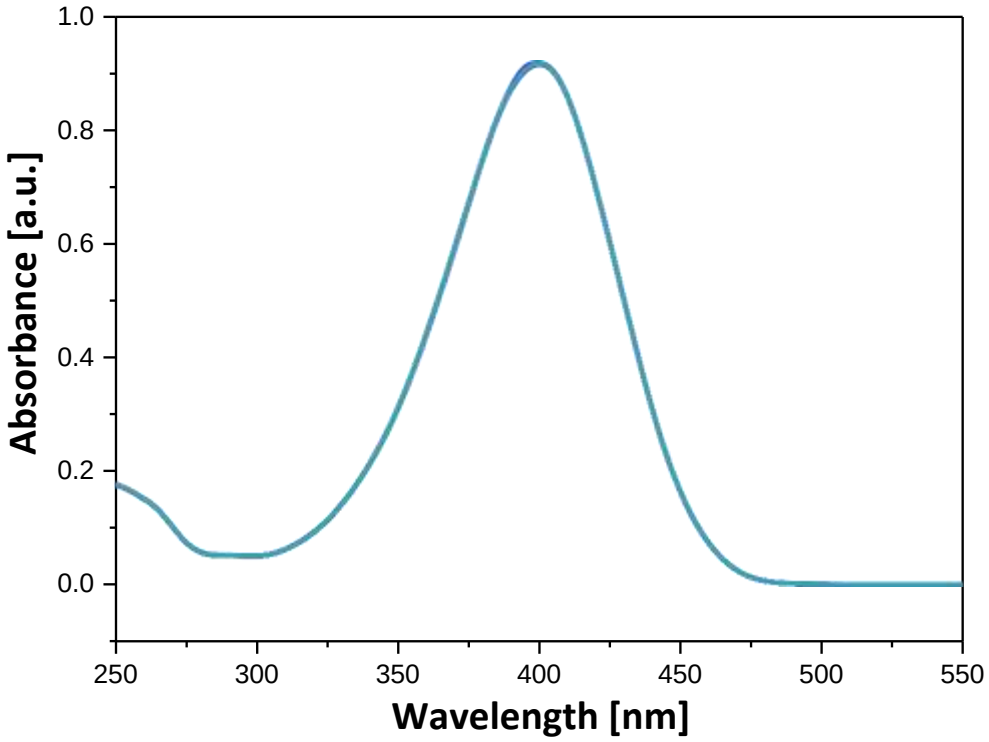

Fig. S7. UV–Vis absorption spectra of the solution containing 4-NP and $NaBH_4$, as recorded after the reaction proceeded for 210 s.

References

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