Supporting Information

Ultrafine Nanoporous Gold via Thiol Compound-Mediated Chemical Dealloying

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Figure S1. SEM images of the C-NPG (a-d) and Cys-NPG (e-d) samples fabricated by dealloying for different time duration. Scale bars: 100 nm.



Figure S2. EDS spectra of C-NPG (a) and Cys-NPG (b) samples.



Figure S3. Histograms of ligament sizes for different types of NPG samples: (a) C-NPG, (b) BDT-NPG, (c) EDT-NPG, (d) CS-NPG, (e) ME-NPG, and (f) EDA-NPG. Scale bars: 100 nm. The data were obtained by analyzing the SEM images of Figure 6 using the software Nano Measurer.



Figure S4. TEM images of different types of NPG samples: (a) C-NPG, (b) BDT-NPG, (c) EDT-NPG, (d) CS-NPG, (e) ME-NPG, and (f) EDA-NPG. Scale bars: 100 nm.



Figure S5. EDS spectra of different types of NPG samples: (a) C-NPG, (b) BDT-NPG, (c) EDT-NPG, (d) CS-NPG, (e) ME-NPG, and (f) EDA-NPG.

Sample name	Fabricati	Average	Residual Ag	
	Additive	Chemical structure	size (nm)	(at%)
C-NPG	Ν	lone	25.2 ± 3.5	3
Cys-NPG	L-cysteine		5.5 ± 0.9	11
BDT-NPG	1,4-Butanedithio	HS	5.5 ± 0.8	26
EDT-NPG	1,2-Ethanedithiol	HS	5.6 ± 0.8	19
CS-NPG	Cysteamine	HSNH ₂	6.9 ± 0.8	10
ME-NPG	2-Mercaptoethanol	HSOH	13.6 ± 1.9	4
EDA-NPG	Ethylenediamine	H ₂ N NH ₂	26.2 ± 5.0	4

Table S1. The fabrication conditions and feature sizes of the NPG samples dealloyed for 4 hrs in an aqueous electrolyte of HNO₃ (38.8 wt%) and the specific additives (0.8 mM).

 Table S2. Comparison with previously reported ultrafine dealloyed Au with ligament/channel width

 under 10 nm.

Dealloy method	Parent alloy	Feature size (nm)	Residual (at%)	Special requirement	Ref. # in maintext
Low-temperature _	commercial AgAu leaf	~5	Ag_6	-20 °C	11
	Al ₂ Au	5 ± 1.0	a few at.% Al	-20 °C; single roller melt spinning	12
Electrochemical	AgAu	6	Ag ₃	melting; potentiastat	6
	commercial AgAuPt leaf	4	Ag39 Pt11	potentiastat	15
	commercial AgAu leaf	8	Ag ₃	potentiastat; pulse electrochemical corrosion	16
Electrochemical & pre-doping	AgAu-Pt	6	Ag11	arc melting; potentiastat; two-step corrosion;	13
Pre-doping	Al ₂ Au-Pt/Pd	3.5 ± 1.0	Pt ₂₀ Al _{3.6}	melting; dealloyed at 90 °C	14
Surfactant- mediation	commercial AgAu	4.3 ± 0.9	Agıı	thiol-compunds	This work