Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

Mechanism of Morphology Transformation During Annealing of Nanostructured Gold Films on Glass

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Electronic Supplementary Information (ESI)

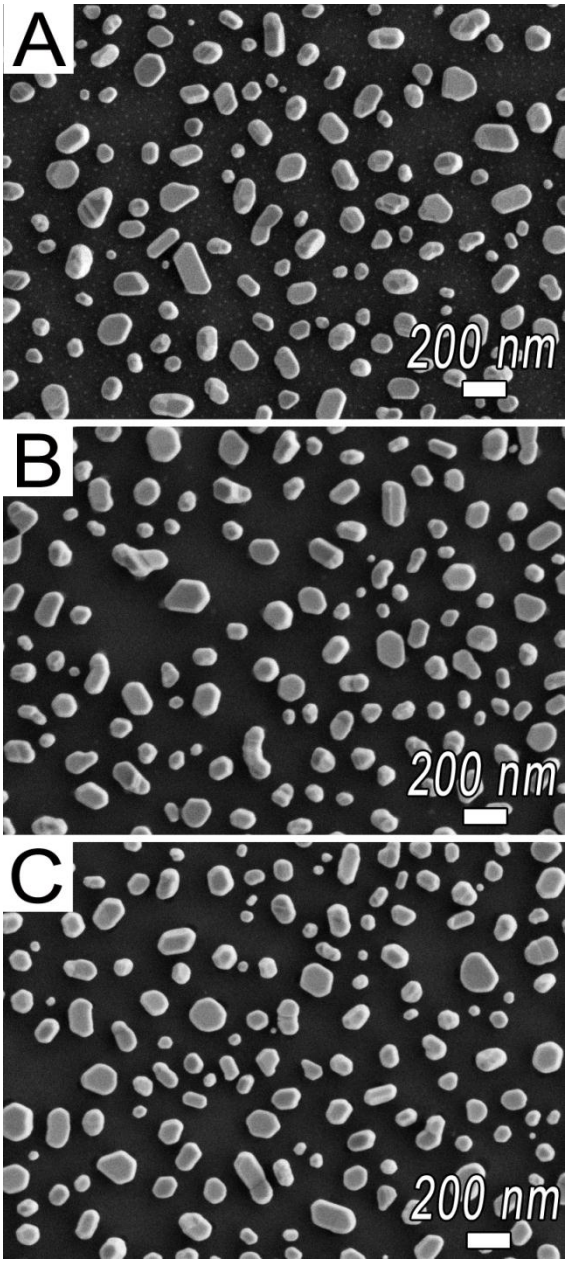
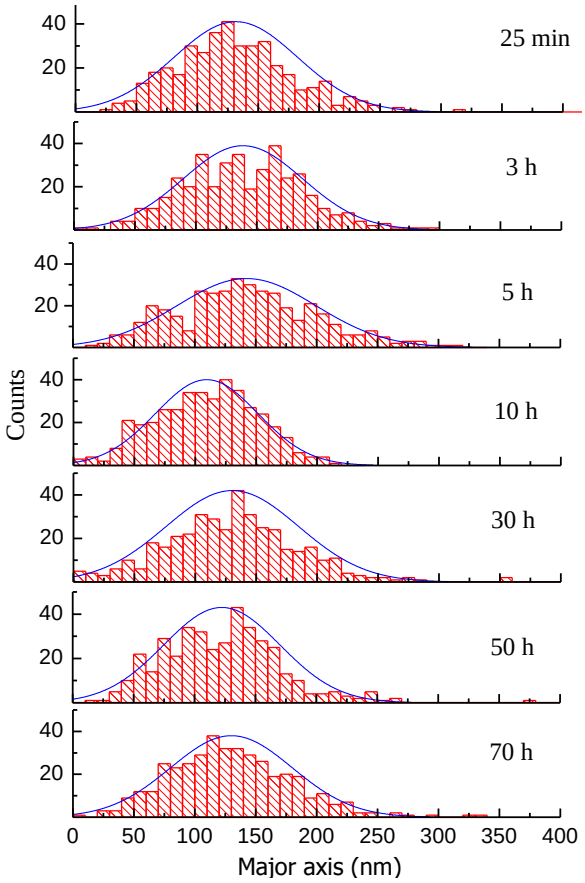


Fig. S1 Representative large-area HRSEM images of 10 nm (nominal thickness) Au films evaporated on glass and annealed at 600 °C for 25 min (A), 3 h (B) and 10 h (C).



Annealing time	x_c (nm)	FWHM (nm)
25 min	125	114
3 h	138	123
5 h	138	128
10 h	111	117
30 h	128	116
50 h	117	113
70 h	124	113

Fig. S2 Left: Major axis histograms for Au island films annealed at 600 °C for various times (indicated). Major axis values were obtained from HRSEM images and analyzed using ImageJ program.[1] 400 NPs were sampled in each image. Right: Table summarizing the values of x_c (mean major axis) and FWHM (full width at half maximum) of the fitted Gaussian function.

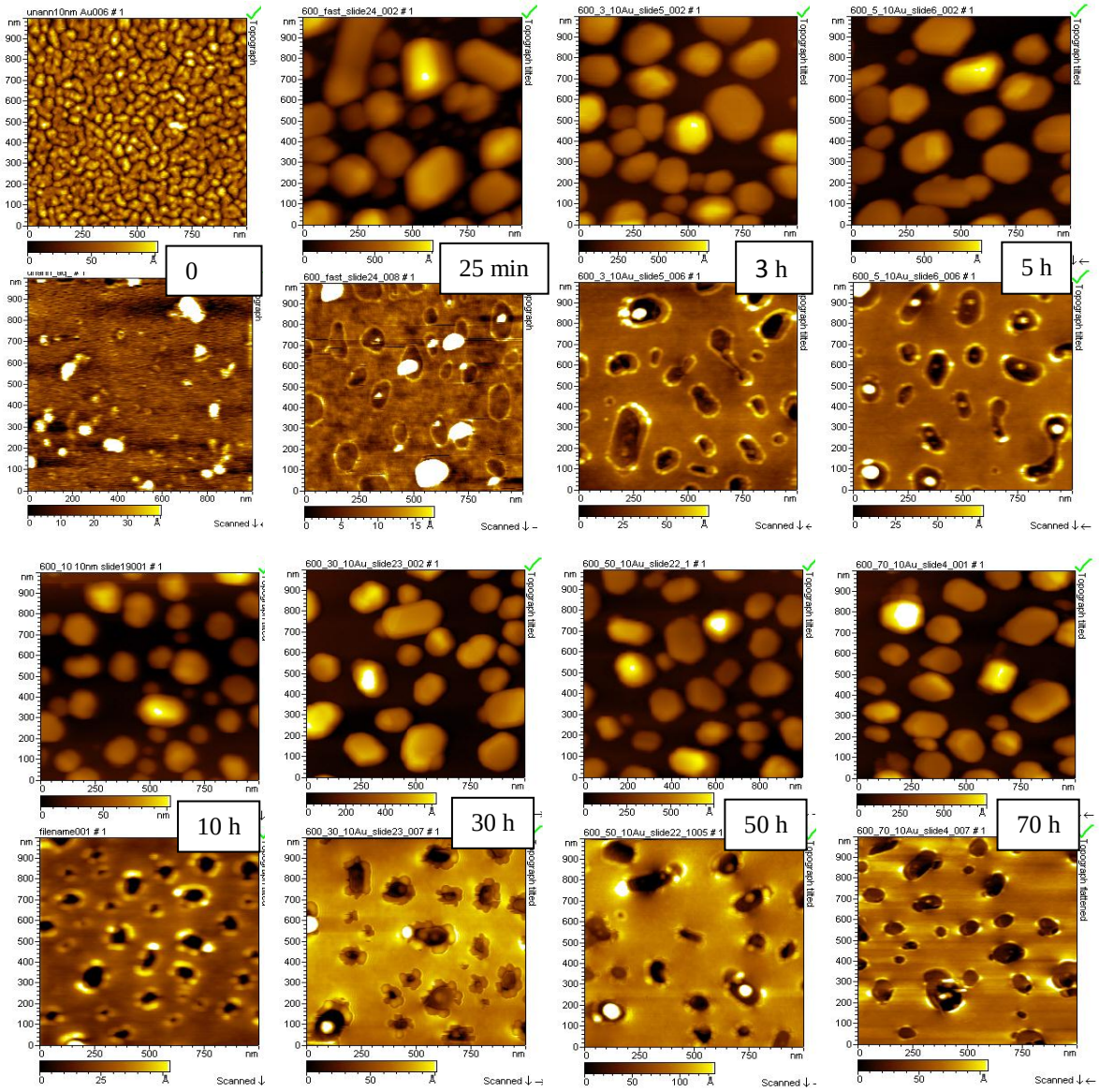


Fig. S3 AFM images of 10 nm (nominal thickness) Au films evaporated on glass and annealed at 600 °C (upper images) and the glass substrates after Au dissolution (lower images). Annealing times are indicated.

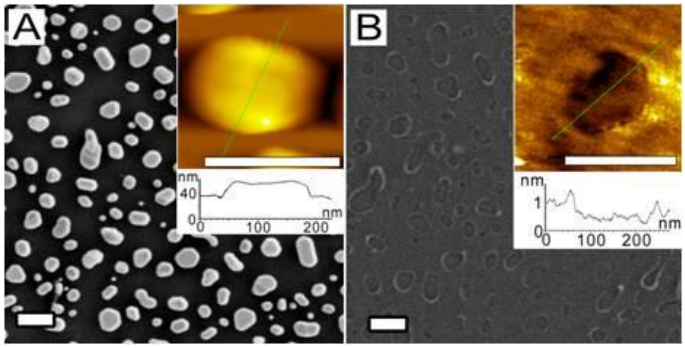


Fig. S4 HRSEM and AFM (insets) images of a 10 nm (nominal thickness) Au film on quartz, annealed 70 h at 600 °C (A), and the quartz substrate after dissolution of the Au islands (B). Scale bars: 200 nm.

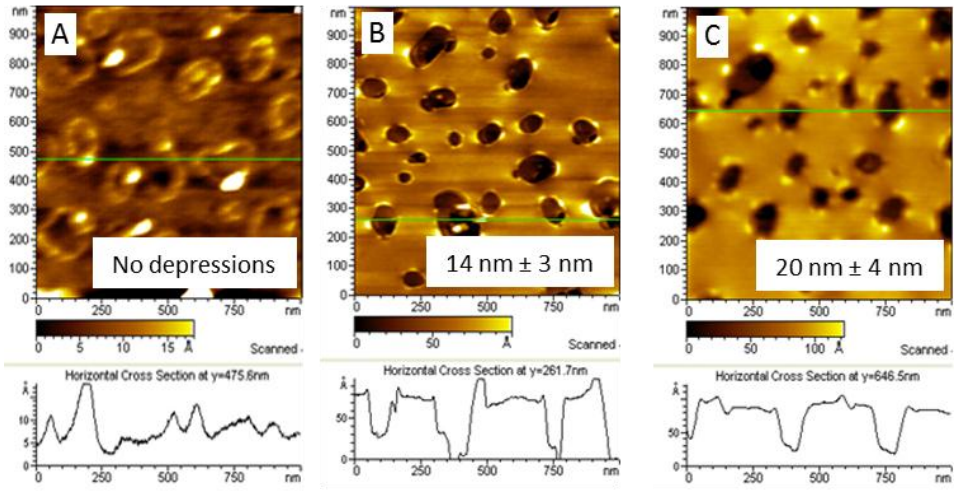


Fig. S5 AFM images and z-profiles of glass substrates after dissolution of 10 nm (nominal thickness) Au films evaporated on glass substrates and annealed 70 h at (A) 500 °C, (B) 600 °C, and (C) 650 °C. Average depression depth (in nm) is indicated in each image.

Table S1. XPS analysis of the glass after dissolution of 10 nm Au island films evaporated on the glass and annealed at 600 °C for indicated time periods. Concentrations are presented in atomic percent.

Element /Time	0 min	25 min	5 h	70 h
K 2p	0.84	1.83	1.79	1.85
B 1s	2.73	2.80	1.61	1.04
Zn 3p	0.71	0.73	0.96	1.06
Na 1s	0.47	0.76	0.75	0.82
Ca 2p	0.04	0.04	0.04	0.05
Al 2p	1.23	1.32	1.27	1.63
Ti 2p	0.49	0.54	0.68	0.98

[1]Rasband, W. *ImageJ 1.29x*, ImageJ 1.29x; National Institute of Health, USA.