Electronic Supplementary Material (ESI) for Nanoscale.

Supplementary Information for

Dewetting Route to Grow Heterostructured Nanoparticles Based on Thin Film Heterojunctions

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Supplementary Table S1

Table S1 Experimental details of the prepared samples with different thickness of the metal heterojunction.

Sample	Deposition Rate		Deposition Time		Thickness		
	Co (nm/s)	Au (nm/s)	Co (s)	Au (s)	Co (nm)	Au (nm)	Total (nm)
1	0.10	0.12	50	42	5.1	5.0	10.1
2	0.11	0.13	64	54	7.0	7.1	14.1
3	0.10	0.12	90	70	9.0	9.0	18.0
4	0.12	0.11	92	100	11.1	11.0	22.1

Supplementary Table S2

Table S2 EDS analysis of an Au bell.

Element	Series	[wt.%]
Cobalt	K-series	0.45811
Gold	L-series	99.5418
Sum		100

Supplementary Table S3

Table S2 EDS analysis of a Co bell.

Element	Series	[wt.%]
Cobalt	K-series	84.44802
Gold	L-series	15.55198
Sum		100

Supplementary Figure S1

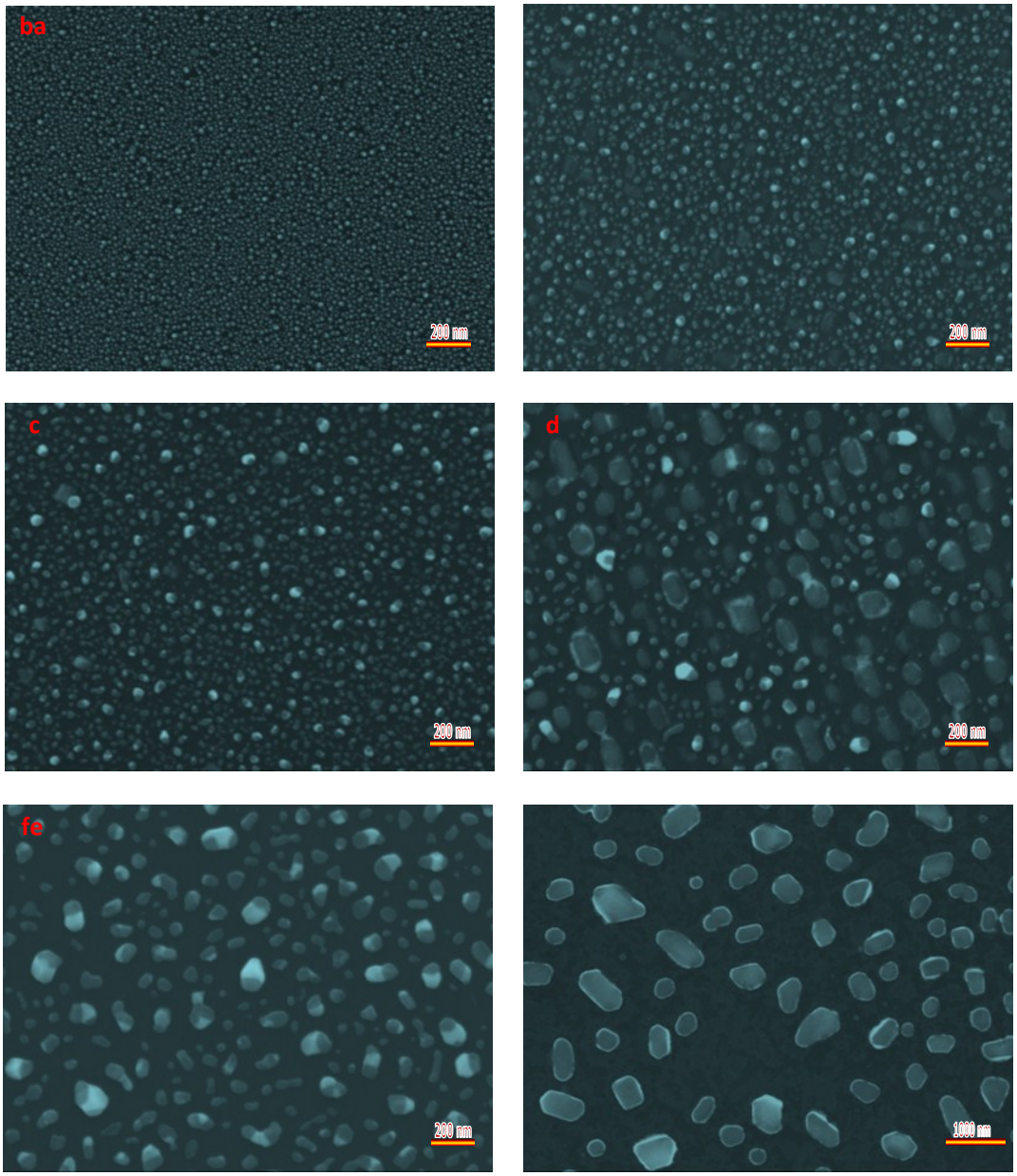

Figure S1 Shape transformation of Co-Au nanoparticles from dumbbells to core-shell. **a**−**c**, SEM images of the sample 1 annealed at 1073 K for 1 min (**a**), 30 min (**b**), and 60 min (**c**). **d**−**f**, SEM images of the sample 2 (**d**), 3 (**e**), and 4 (**f**) annealed at 1073 K for 60 min.

Supplementary Figure S2

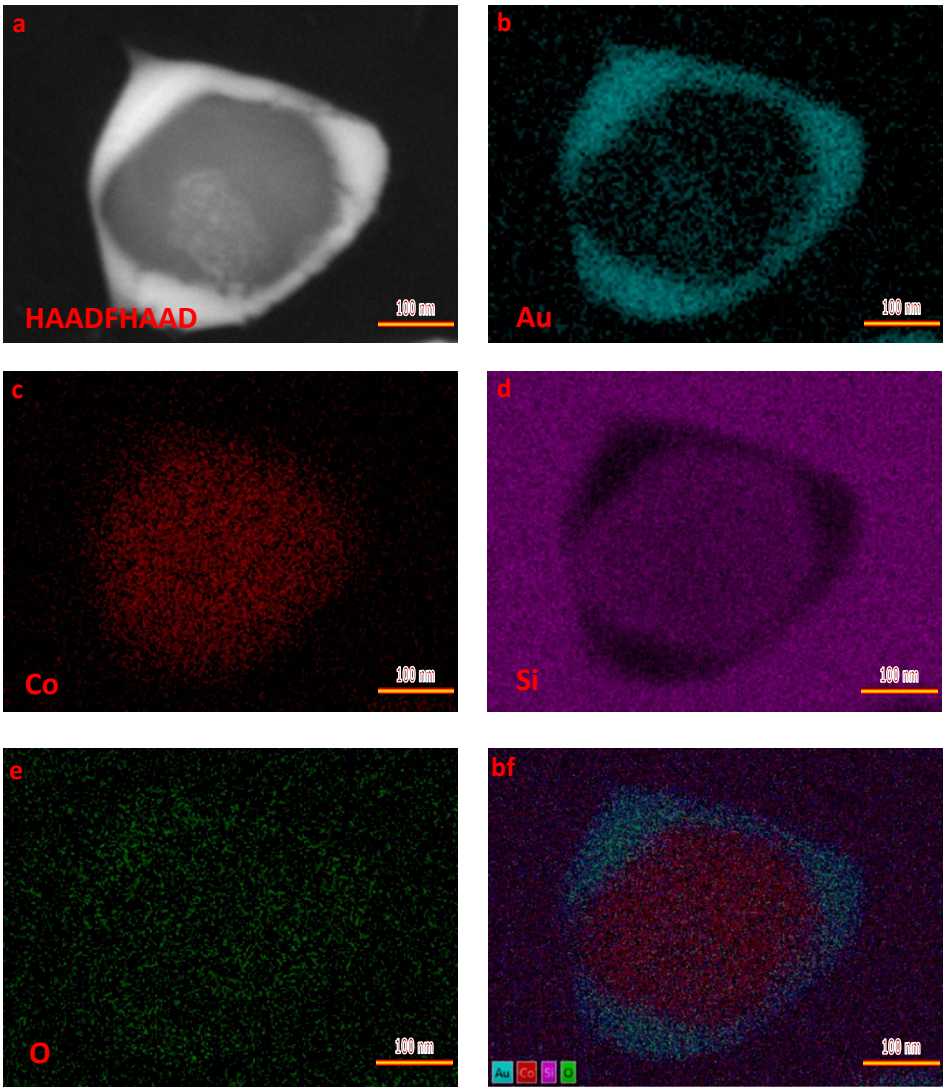

Figure S2 EDS mapping of an individual Co-Au core-shell nanoparticle. **a**, Enlarged SEM image of a Co-Au core-shell nanoparticle. **b**–**f,** The Au, Co, Si, O, and their combined EDS mapping of the core-shell nanoparticle.

Supplementary Figure S3

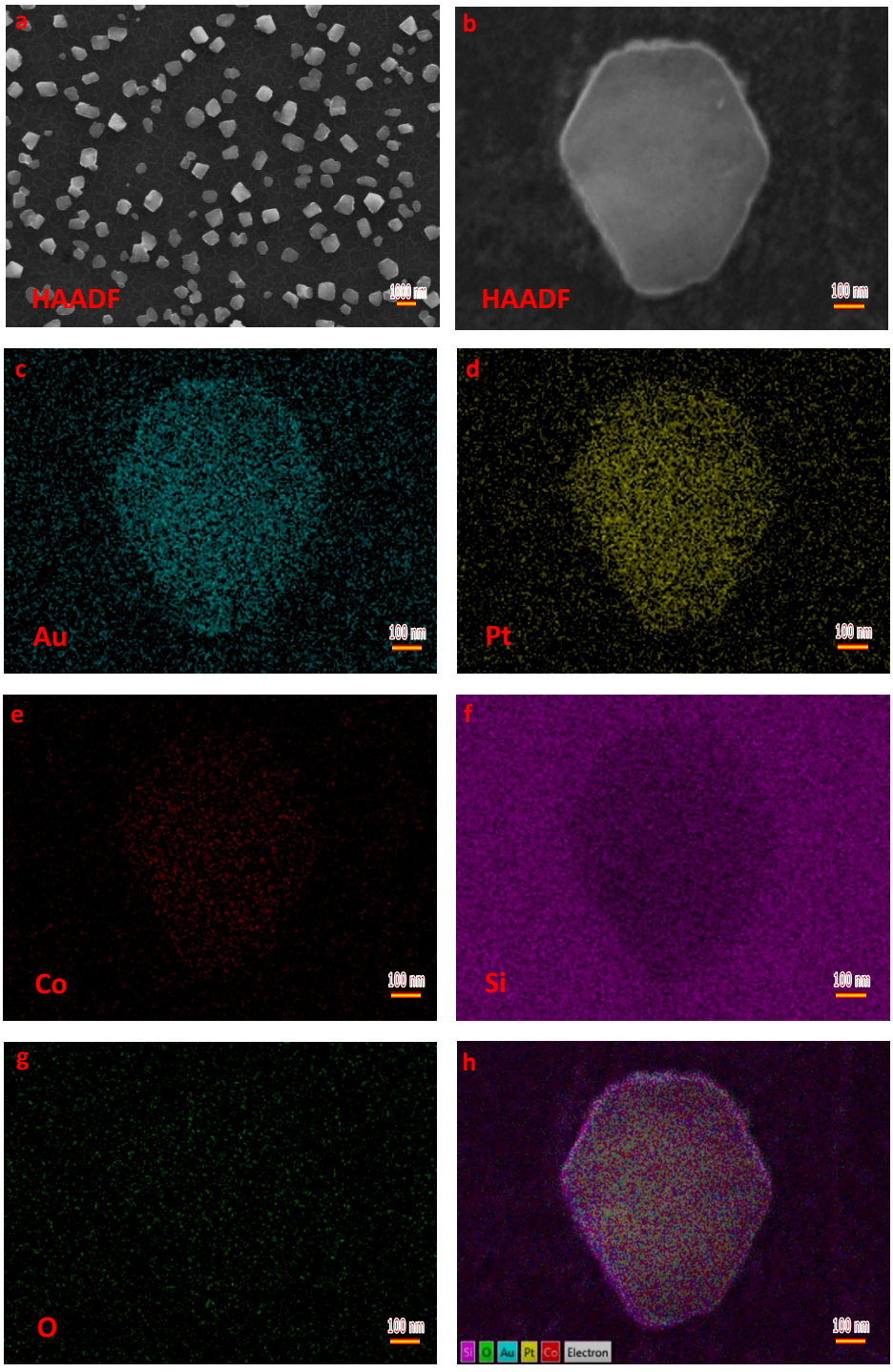

Figure S3 Morphology and composition of CoPt-Au core-shell nanoparticles. **a,** A typical SEM image of CoPt-Au core-shell nanoparticles. **b,** An enlarged SEM image of a CoPt-Au core-shell nanoparticle. **c**–**f,** The Au, Pt, Co, Si, O, and their combined

EDS mapping of the core-shell nanoparticle. The CoPt-Au core-shell nanoparticles were fabricated by annealing Si/Pt(15.0 nm)/Co(5.1 nm)/Au(20.0 nm) heterojunction at 1073 K for 60 min in vacuum.

Supplementary Figure S4

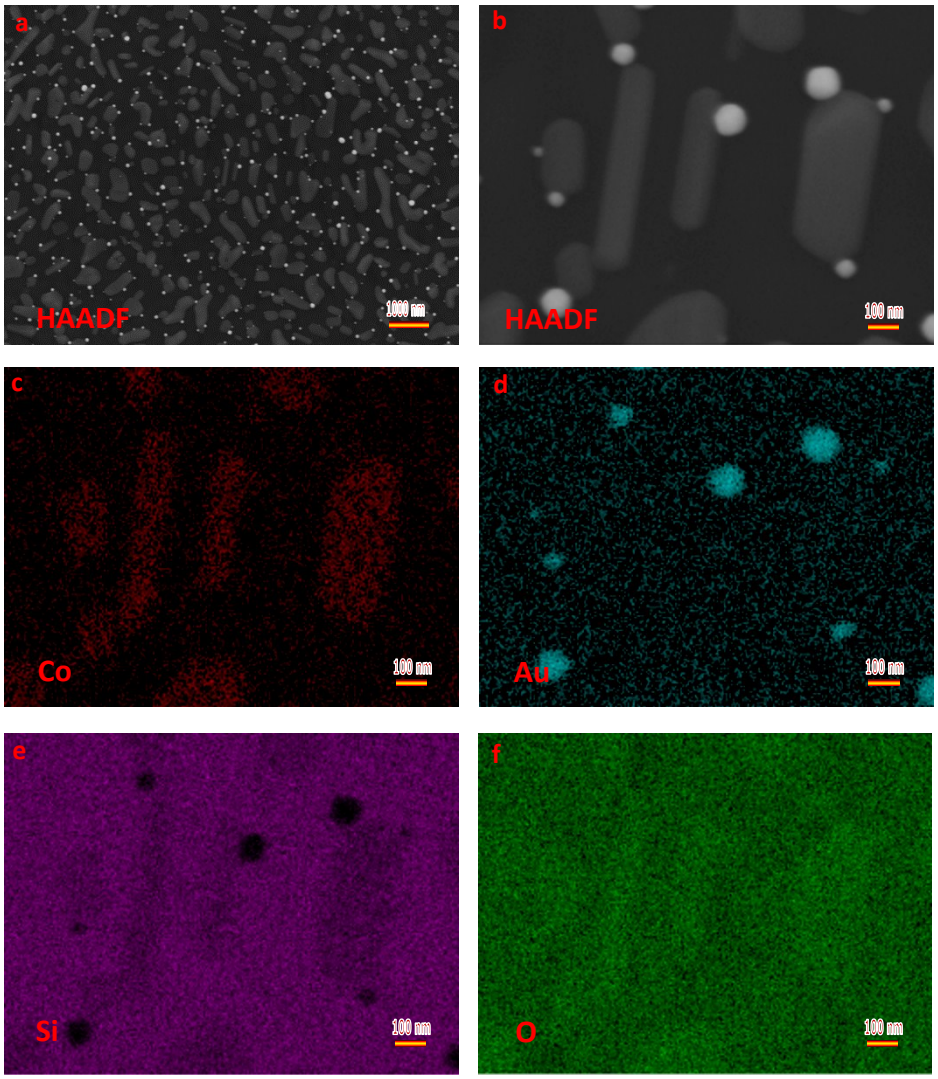

Figure S4 Morphology and composition of CoO-Au heterostructured nanoparticles. **a,** A typical SEM image of CoO-Au heterostructured nanoparticles. **b,** An enlarged SEM image of the CoO-Au heterostructured nanoparticles. **c**–**f,** The Co, Au, Si, and O EDS mapping of the heterostructured nanoparticles. The CoO-Au nanoparticles were fabricated by annealing Si/Co(11.1 nm)/Au(11.0 nm) heterojunction at 1273 K for 60 min in air.

Supplementary Figure S5

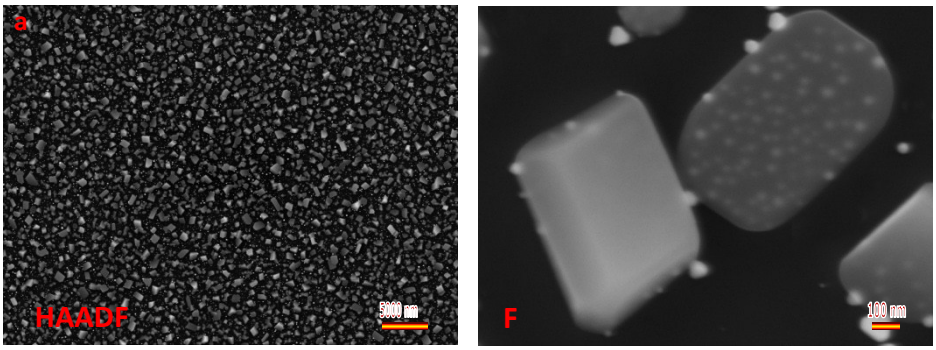

Figure S5 Morphology of MgO-Pt heterostructured nanoparticles. **a,** A typical SEM image of the MgO-Pt heterostructured nanoparticles. **b,** Enlarged SEM image of the MgO-Pt heterostructured nanoparticles. The MgO-Pt heterostructured nanoparticles were fabricated by annealing Si/MgO(20.1 nm)/Pt(10.0 nm) heterojunction at 1273 K for 60 min in air.