Electronic Supplementary Information

Electrochemical Dealloying as a Tool to Tune Porosity, Composition and Catalytic Activity of Nanomaterials

Christian Rurainsky,[a] Alba Garzón Manjón[b], Felix Hiege[a], Yen-Ting Chen[c], Christina Scheu*[b] and Kristina Tschulik*[a]

S 1 Nanoparticle characterization

Table S1. Nanoparticles size measured with TEM, relative molar amount of Ag remaining in AgAu nanoparticles after dealloying for various numbers of cycles, determined by electrochemical dissolution in HCl and measured catalytic current density at -1.1 V vs. MSE in 0.5 M H_2SO_4.

	Size [nm]		Ag content [mol%]		Catalytic current density [mol/cm²]	
AgAu	30	±9	83	±6	9	±4
0.5 cycles	29	±10	66	±11	124	±40
100 cycles	26	±10	18	±10	254	±58
500 cycles	25	±9	21	±4	76	±10
1000 cycles			25	±7	103	±25
2000 cycles			22	±6	97	±10
4000 cycles			14	±9	77	±23

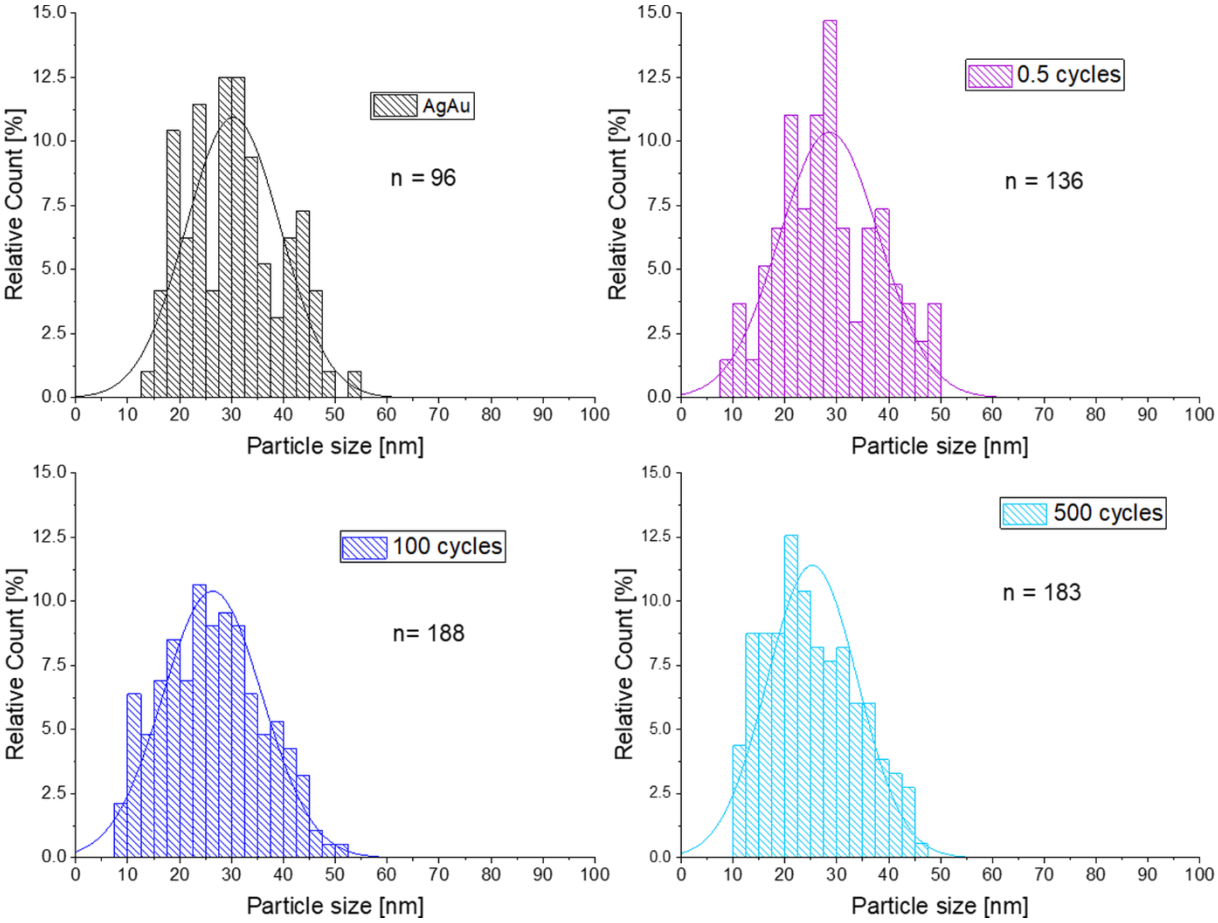

Figure S1. Histograms of the size determination of the AgAu nanoparticles, without treatment, after 0.5 cycles, after 100 cycles and after 500 cycles.

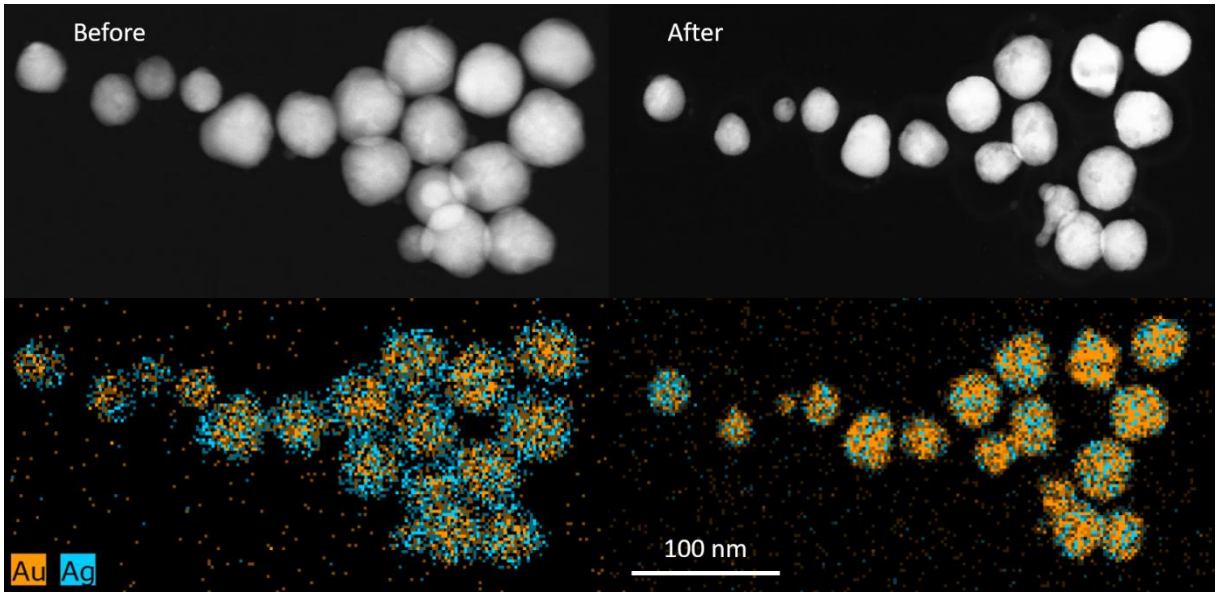

Figure S2. Identical location TEM with STEM images, SEI and EDX mapping, before and after dealloying for 100 cycles in 1 M $HClO_4$.

S 2 Electrocatalytic Response

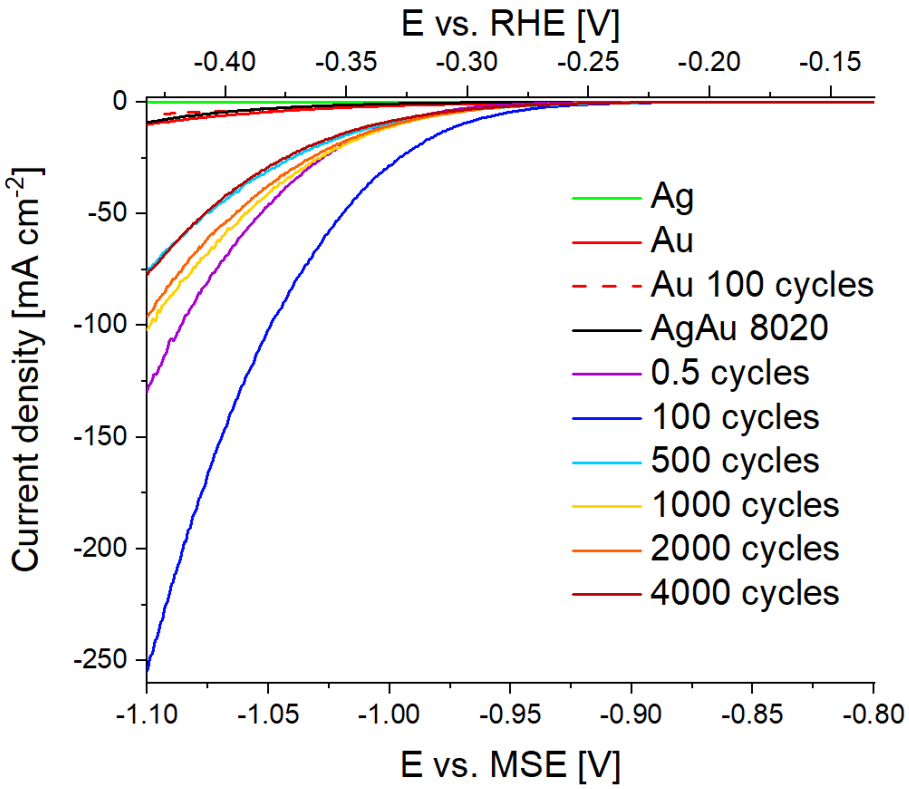

Figure S3. Averaged catalytic LSV curves at 2 mV s^{-1} in 0.5 M H_2SO_4 using pure silver, pure gold, 100 cycles "dealloyed" gold, non-dealloyed AgAu 80:20 and dealloyed AgAu nanoparticles at different amount of cycles, the currents are normalised to the electrochemically determined surface area of the particles.