Supporting Information

Size-Controlled Gold Nanoparticles Synthesized in Solution Plasma

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1. Characteristics of the solutions before and after SPP

Table S1. pH and conductivity of the gold solutions before and after the Solution Plasma Processing (SPP).

solution	pH		σ / μS cm^{-1}	
	before	after	before	after
1.	3.2	3.0	350	820
2.	6.5	3.6	130	470
3.	12.0	10.6	1130	1010

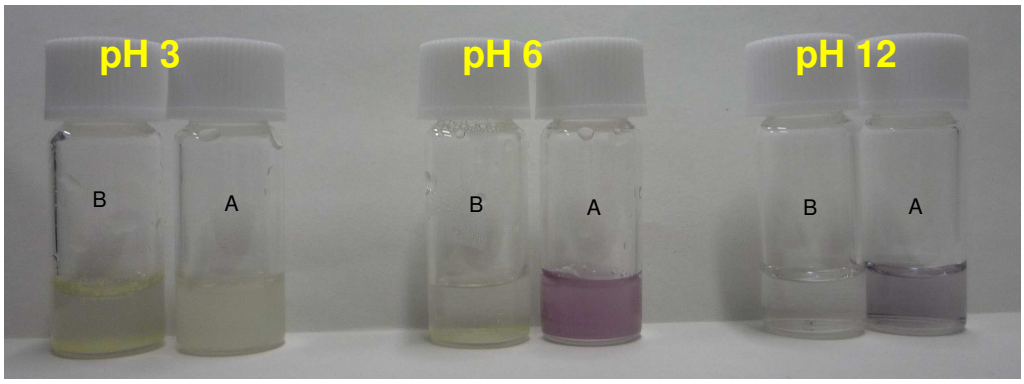


Figure S1. Photo of the gold solutions prepared at different pH values, before (B) and after (A) SPP.

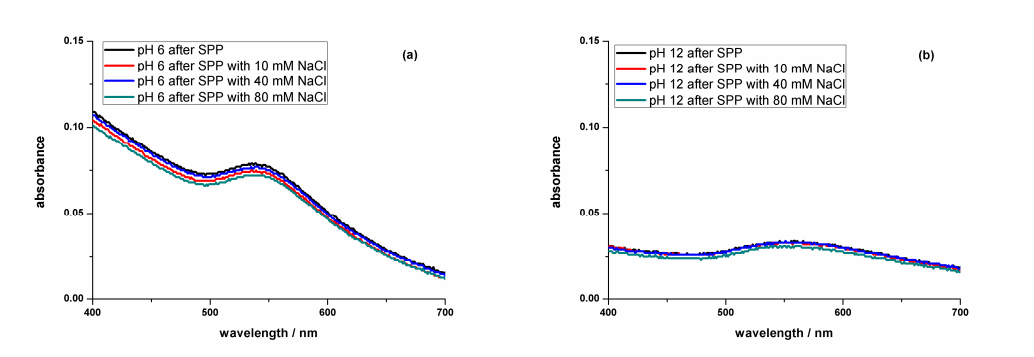


Figure S2. UV-visible spectra for gold NPs solutions with (a) pH 6 and (b) pH 12 before and after addition of NaCl solution. The final concentration of NaCl in the mixture was adjusted from 10 to 80 mM.

2. EDS analysis

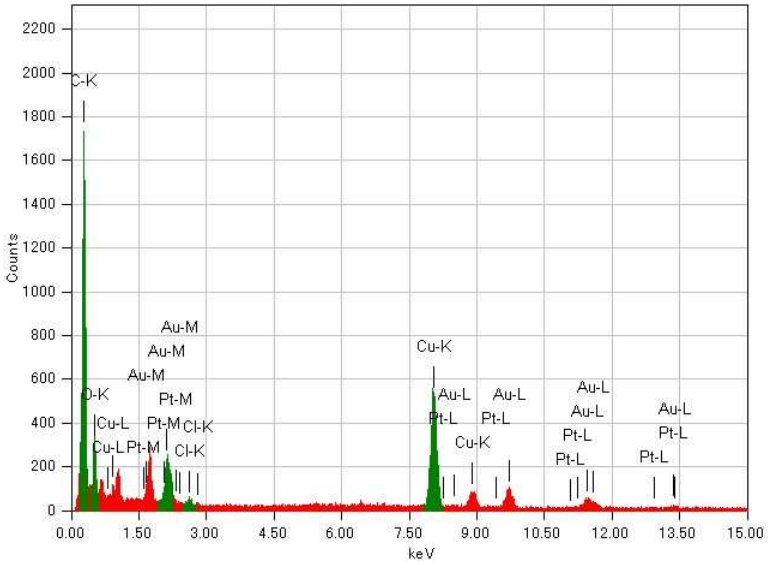
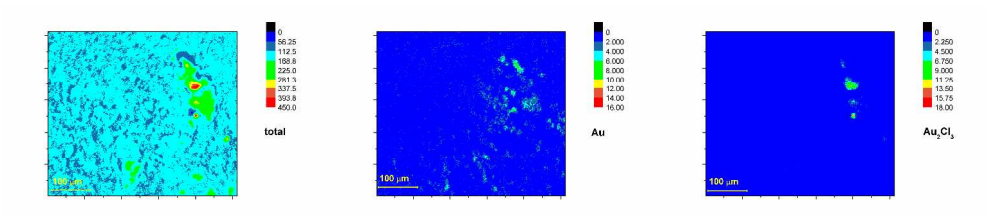
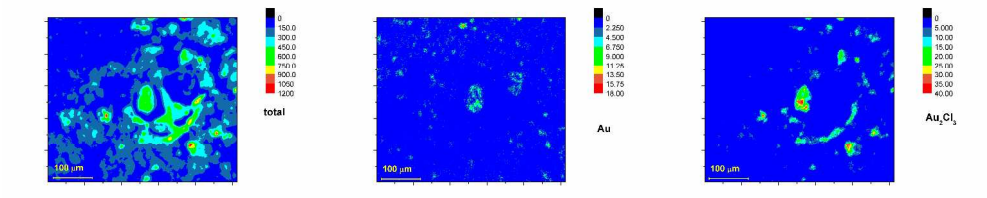


Figure S3. EDS analysis of gold NPs synthesized in pH 12 solution. The high energy spectral region from 7.50 to 15.00 eV was used to identify the elemental composition of the sample. In this region signals from Pt transitions were not detected. The low energy spectral region cannot be used to identify the atomic composition, where the peaks overlap due to the poor resolution.

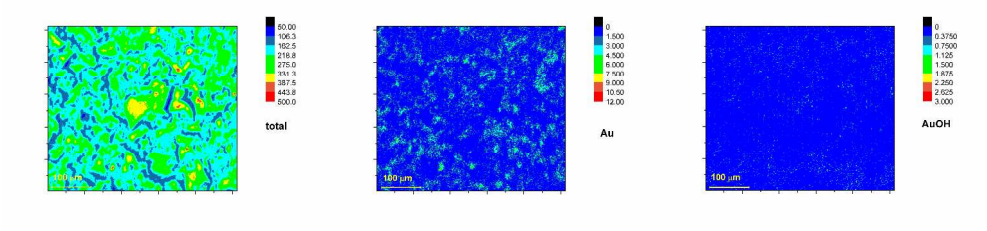
3. ToF-SIMS maps



(a)



(b)



(c)

Figure S4. ToF-SIMS maps of different solutions dropped on silicon substrates, in case of (a) pH 3 solution, (b) pH 6 solution, and (c) pH 12 solution. The intensity of the signal is shown in counts×10^{-2}.

4. Formulas for calculation of different broadening effects for H_β line.[1]

Calculation of the van der Waals broadening (Lorentz shape):

$\Delta\lambda_{vdW} = \dfrac{4.10}{T_g^{7/10}}$ in (nm), where T_g is the gas temperature.

Calculation of the Doppler broadening (Gauss shape):

$\Delta\lambda_D = 3.48\times10^{-4}T_g^{1/2}$ in (nm), where T_g is the gas temperature.

References

(1) Bruggeman, P.; Schram, D.; González, M.Á.; Rego, R.; Kong, M.G.; Leys, C. *Plasma Sources Sci. Technol*. **2009**, *18*, 025017-1 - 025017-13.