Supplementary Materials for

Room temperature surfactant-free synthesis of gold nanoparticles in alkaline ethylene glycol

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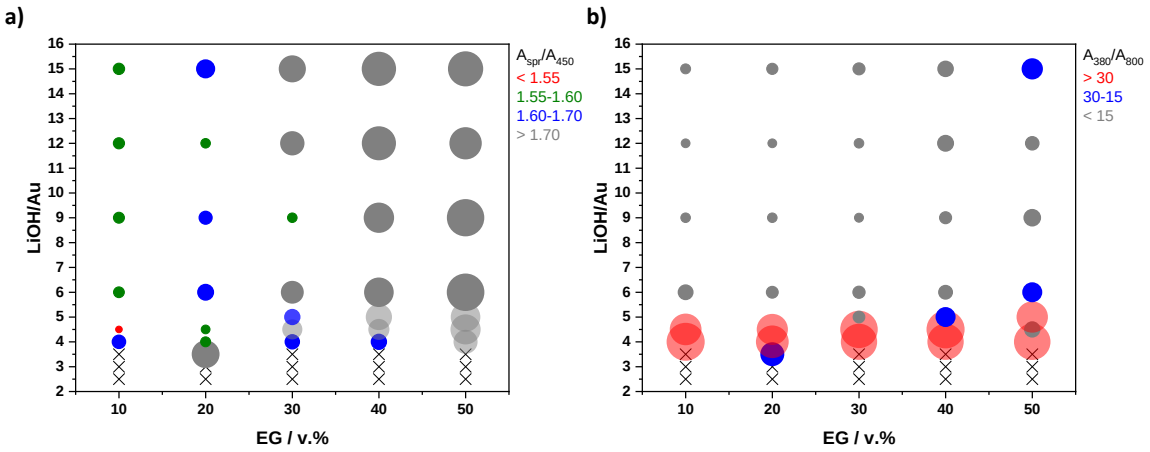

Figure S1. λ_{spr}/A_{450} and λ_{380}/A_{800} values for the parametric study. (**a**) λ_{spr}/A_{450} and (**b**) λ_{380}/A_{800} values for samples prepared under different synthetic conditions. The size of the data points corresponding to a given v.% of EG and LiOH/$HAuCl_4$ ratio is proportional to the (**a**) λ_{spr}/A_{450} and (**b**) λ_{380}/A_{800} values. The concentration of $HAuCl_4$ was 0.5 mM.

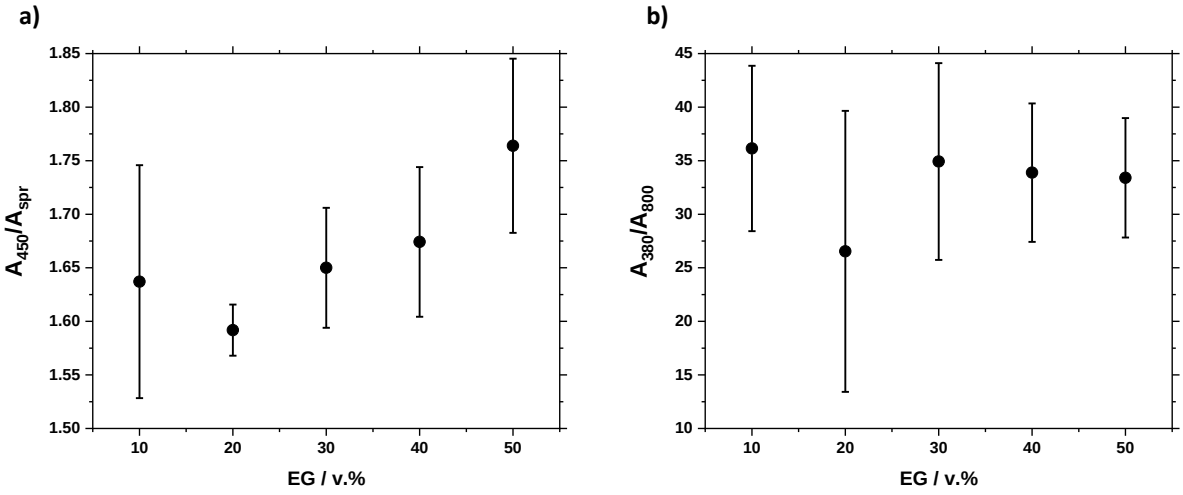

Figure S2. λ_{spr}/A_{450} and λ_{380}/A_{800} values for replicated experiments. (**a**) λ_{spr}/A_{450} and (**b**) λ_{380}/A_{800} values and standard deviations for 3 independent experiments, samples prepared for different v.% of EG as indicated and a LiOH/$HAuCl_4$ ratio of 4. The concentration of $HAuCl_4$ was 0.5 mM.

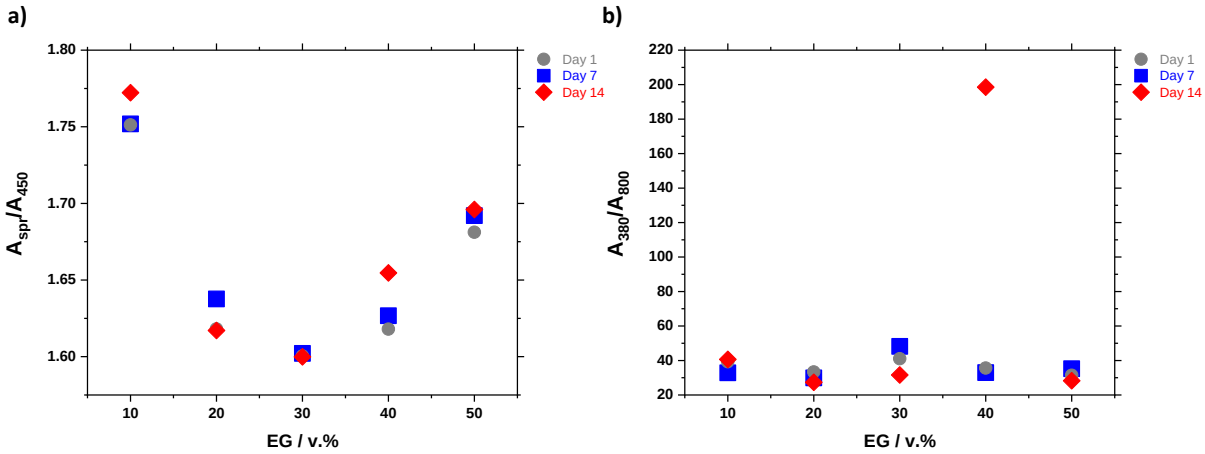

Figure S3. λ_{spr}/A_{450} and λ_{380}/A_{800} values for time studies. (**a**) λ_{spr}/A_{450} and (**b**) λ_{380}/A_{800} values for samples prepared for different v.% of EG as indicated and a LiOH/$HAuCl_4$ ratio of 4. The concentration of $HAuCl_4$ was 0.5 mM. The UV-vis characterization was performed 1, 7 or 14 days after synthesis, as indicated.

Table S1. Parameters retrieved from UV-vis analysis for all samples. The total volume was 3 mL and the final $HAuCl_4$ concentration was 0.5 mM. For sake of clarity, the dataset discussed in Figure 2 of the main manuscript is the dataset A, the dataset discussed in Figure 3 of the main manuscript is the dataset B highlighted using bold characters, and the dataset discussed in Figure 4 of the main manuscript is highlighted using italic front style.

Data set	Day	EG v.%	LiOH/Au	λ_{spr} nm	$\Delta\lambda/\lambda_{spr}$ %	A_{650}/A_{spr}	A_{380}/A_{800}	A_{spr}/A_{450}	$A_{400}/A_{400\text{-}max}$ *
A	1	10	2.5	X	X	X	X	X	X
A	1	10	3	X	X	X	X	X	X
A	1	10	3.5	X	X	X	X	X	X
A/**B**	**1**	**10**	**4**	**519**	**5.97**	**0.066**	**42**	**1.625**	0.90 / **0.91**
B/C	**1**	**10**	**4**	**522**	**5.75**	**0.066**	**39**	**1.751**	**0.91** / *0.95*
C	*7*	*10*	*4*	*522*	*5.94*	*0.078*	*33*	*1.752*	*0.92*
C	*14*	*10*	*4*	*523*	*5.73*	*0.074*	*41*	*1.772*	*0.91*
B	**1**	**10**	**4**	**518**	**6.37**	**0.086**	**27**	**1.535**	**0.49**
A	1	10	4.5	517	6.58	0.079	33	1.515	0.55
A	1	10	6	524	7.06	0.160	11	1.583	0.20
A	1	10	9	530	7.17	0.273	3	1.588	0.20
A	1	10	12	542	9.78	0.553	2	1.589	0.49
A	1	10	15	529	7.56	0.298	4	1.594	0.35
A	1	20	2.5	X	X	X	X	X	X
A	1	20	3	X	X	X	X	X	X
A	1	20	3.5	528	6.82	0.135	22	1.823	0.93
A/**B**	**1**	**20**	**4**	**517**	**6.38**	**0.072**	**35**	**1.571**	0.92 / **0.93**
B/C	***1***	***20***	***4***	***519***	***6.17***	***0.079***	***33***	***1.618***	**0.94** / *0.98*
C	*7*	*20*	*4*	*520*	*6.15*	*0.081*	*30*	*1.638*	*0.97*
C	*14*	*20*	*4*	*523*	*7.08*	*0.166*	*27*	*1.617*	*0.97*
B	**1**	**20**	**4**	**526**	**6.84**	**0.170**	**11**	**1.586**	**0.72**
A	1	20	4.5	519	6.36	0.080	32	1.552	0.86
A	1	20	6	529	6.99	0.226	7	1.661	0.56
A	1	20	9	532	7.71	0.357	3	1.620	0.52
A	1	20	12	538	9.67	0.560	2	1.567	0.58
A	1	20	15	538	8.92	0.338	6	1.693	0.49
A	1	30	2.5	X	X	X	X	X	X
A	1	30	3	X	X	X	X	X	X
A	1	30	3.5	X	X	X	X	X	X
A/**B**	**1**	**30**	**4**	**519**	**6.17**	**0.069**	**39**	**1.639**	0.94 / **0.95**
B/C	***1***	***30***	***4***	***519***	***6.17***	***0.070***	***41***	***1.600***	**0.95** / *0.98*
C	*7*	*30*	*4*	*519*	*6.17*	*0.070*	*48*	*1.602*	*0.98*
C	*14*	*30*	*4*	*520*	*6.35*	*0.079*	*32*	*1.600*	*1.00*
B	**1**	**30**	**4**	**525**	**6.10**	**0.093**	**24**	**1.711**	**0.78**
A	1	30	4.5	523	6.12	0.071	41	1.709	0.93
A	1	30	5	527	6.83	0.192	7	1.652	0.66
A	1	30	6	532	6.77	0.209	7	1.749	0.81
A	1	30	9	536	10.26	0.556	2	1.566	0.57

A	1	30	12	542	8.30	0.384	4	1.772	0.76
A	1	30	15	540	7.78	0.261	7	1.814	0.86
A	1	40	2.5	X	X	X	X	X	X
A	1	40	3	X	X	X	X	X	X
A	1	40	3.5	X	X	X	X	X	X
A/**B**	**1**	**40**	**4**	**520**	**5.96**	**0.070**	**39**	**1.652**	0.94 / **0.95**
B/*C*	***1***	***40***	***4***	***519***	***6.36***	***0.073***	***36***	***1.618***	**0.96** / *1.00*
C	*7*	*40*	*4*	*519*	*6.36*	*0.080*	*33*	*1.627*	*0.99*
C	*14*	*40*	*4*	*522*	*6.51*	*0.089*	*199*	*1.655*	*0.97*
B	**1**	**40**	**4**	**525**	**6.29**	**0.090**	**27**	**1.752**	**0.94**
A	1	40	4.5	524	6.49	0.073	42	1.722	0.98
A	1	40	5	530	6.79	0.132	17	1.800	0.97
A	1	40	6	534	6.55	0.176	10	1.849	0.91
A	1	40	9	541	7.39	0.241	7	1.860	0.92
A	1	40	12	542	7.20	0.187	12	1.916	0.97
A	1	40	15	542	7.38	0.189	12	1.921	0.96
A	1	50	2.5	X	X	X	X	X	X
A	1	50	3	X	X	X	X	X	X
A	1	50	3.5	X	X	X	X	X	X
A/**B**	**1**	**50**	**4**	**523**	**5.74**	**0.067**	**40**	**1.767**	0.94 / **1.00**
B/*C*	***1***	***50***	***4***	***522***	***6.32***	***0.086***	***31***	***1.681***	**0.95** / *1.00*
C	*7*	*50*	*4*	*522*	*6.51*	*0.083*	*35*	*1.692*	*0.97*
C	*14*	*50*	*4*	*524*	*6.49*	*0.095*	*28*	*1.696*	*0.98*
B	**1**	**50**	**4**	**530**	**6.60**	**0.088**	**29**	**1.844**	**0.96**
A	1	50	4.5	531	6.22	0.141	11	1.859	0.91
A	1	50	5	532	6.02	0.082	32	1.922	0.99
A	1	50	6	538	6.51	0.145	17	1.971	0.99
A	1	50	9	542	7.01	0.171	14	1.968	0.99
A	1	50	12	536	6.90	0.160	9	1.890	0.91
A	1	50	15	539	7.05	0.130	18	1.936	1.00

* Different $A_{400\text{-}max}$ were used for the different datasets A, B or C.