Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

Methylviologen mediated electrosynthesis of gold nanoparticles in the solution bulk

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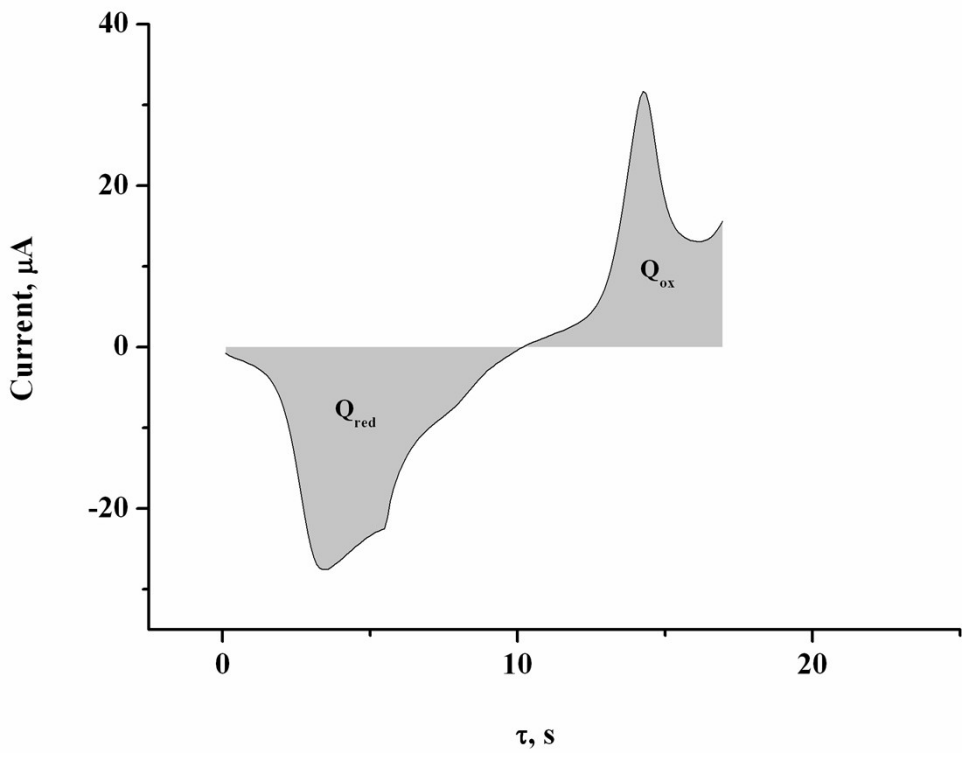

Fig. S1 Current *vs*. time plot obtained by conversion of the cyclic voltammogram for AuCl presented in Fig. 1 (curve *a*).

Table S1 Modes of Au(I) (1.5 mM) reduction under CV and microelectrolysis conditions and characteristics of Au_{dep} formed.

Mediator	Au(I) reduction				Au_{dep} characteristics			
	Mode	E,[a] V	τ,[b] s	Q_{red}, μA·s	E range in Q_{ox} calculation, V	Q_{ox}, μA·s	m, μg	Q_{ox}/ Q_{red}, %
-	CV	+0.05	-	120	0.51-1.20	78	0.16	65
		-0.85	-	-	0.08-1.20	200	0.41	-
MV^{2+} (2.0 mM)	CV	+0.05	-	165	0.60-1.20	92	0.19	56
		-0.85	-	-	0.57-1.20	187	0.38	-
	micro-electro-lysis	+0.20	0		0.64-1.20	63	0.13	-
		+0.20	30		0.57-1.20	125	0.26	-
		+0.20	60		0.46-1.20	211	0.37	-
		-0.85	0		0.36-1.20	120	0.25	-
		-0.85	30		0.39-1.20	77	0.16	-
		-0.85	60		0.29-1.2	38	0.08	-

[a] CV reversal potential or microelectrolysis potential; [b] microelectrolysis time

Fig. S2 A picture of 2.0 mM MV^{2+} + 1.5 mM AuCl + 1 g/l SiO_2-NHR solutions in H_2O/0.1 M NaCl: starting solution (left) and solution after reduction at -0.90 V (Q = 1.3 F with respect to AuCl) (right).

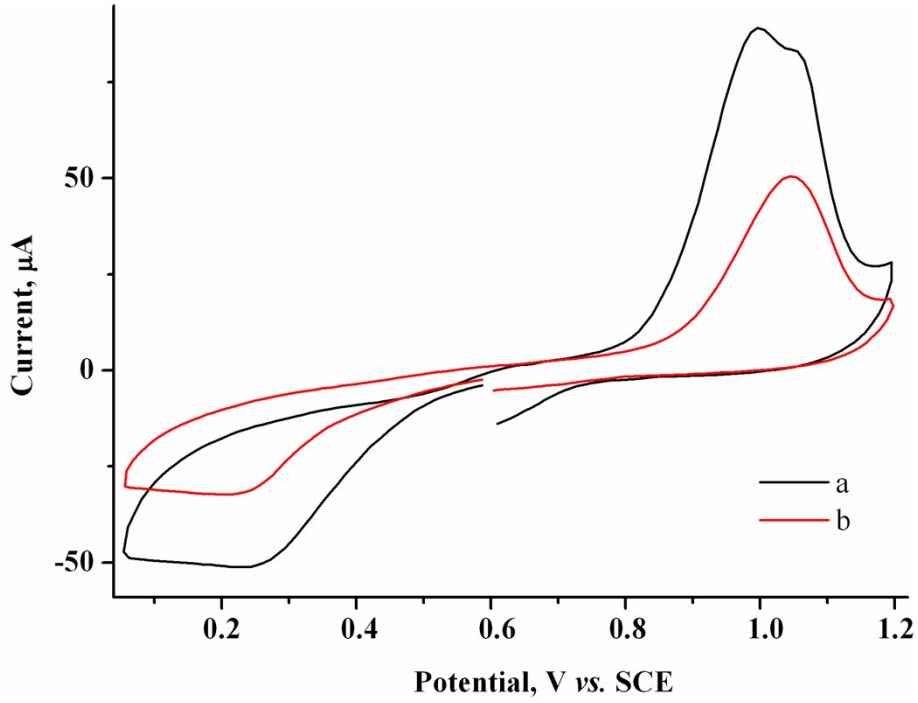

Fig. S3 CV curves of 1.5 mM AuCl in the absence (a) and in the presence of 75 mM PVP (b). GC, H_2O/0.1 M NaCl, ν = 100 mV/s.

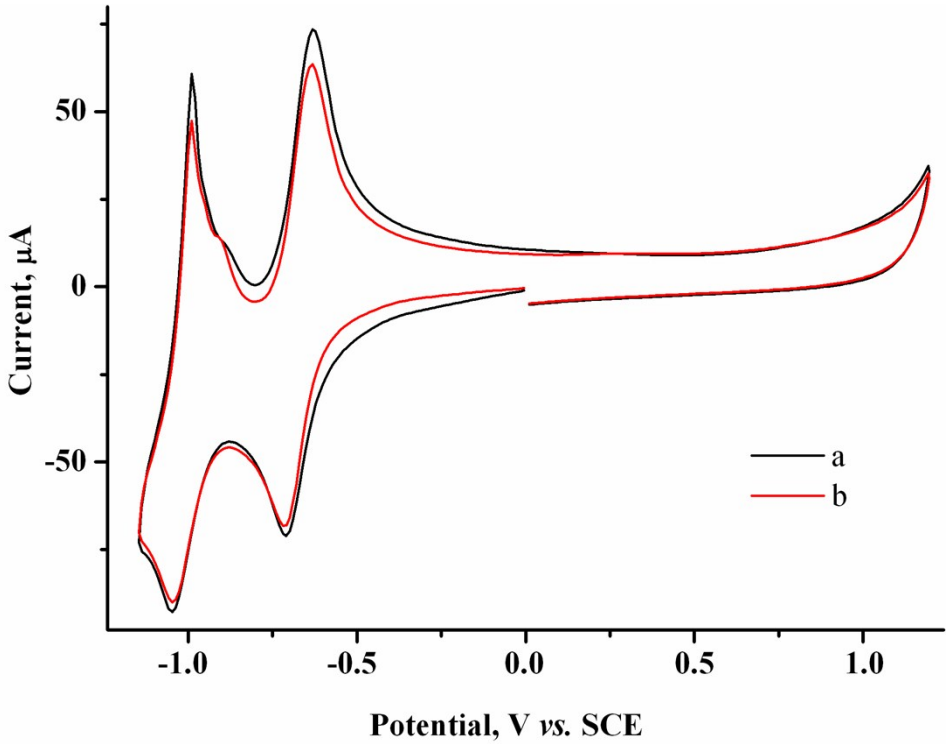

Fig. S4 CV curves of 2.0 mM MV^{2+} in the absence (a) and in the presence of 75 mM PVP (b). GC, H_2O/0.1 M NaCl, ν = 100 mV/s.

Fig. S5 A picture of 2.0 mM MV^{2+} + 1.5 mM AuCl + 75 mM PVP solutions in H_2O/0.1 M NaCl: starting solution (1) and solution after reduction at -0.90 V at Q = 0.2 F (2) and 1.1 F (3) with respect to AuCl.

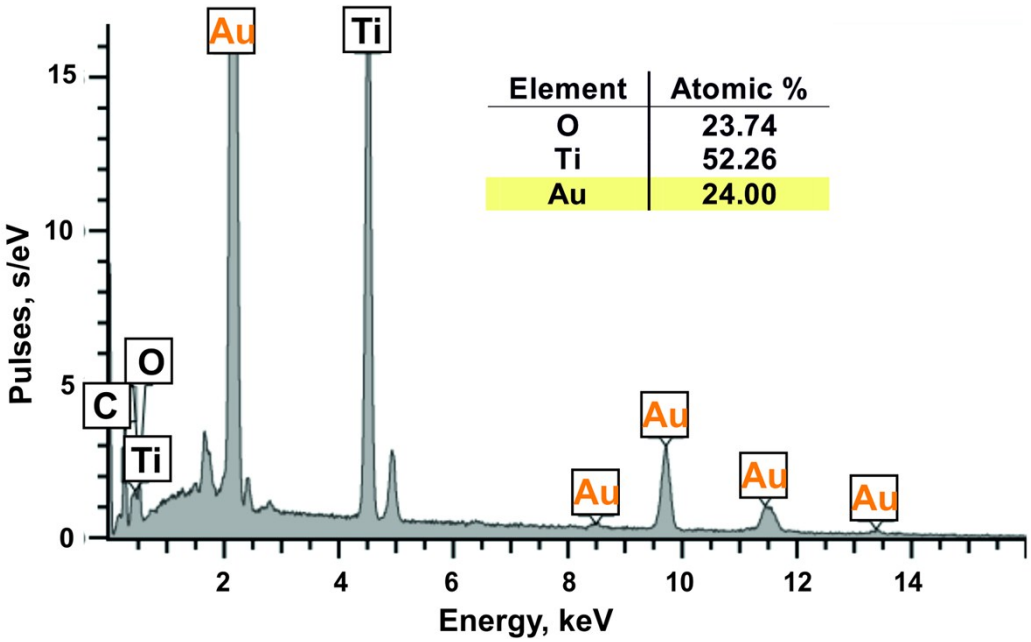

Fig. S6 Energy-dispersion spectrum of gold nanoparticles stabilized by PVP on a titanium support.

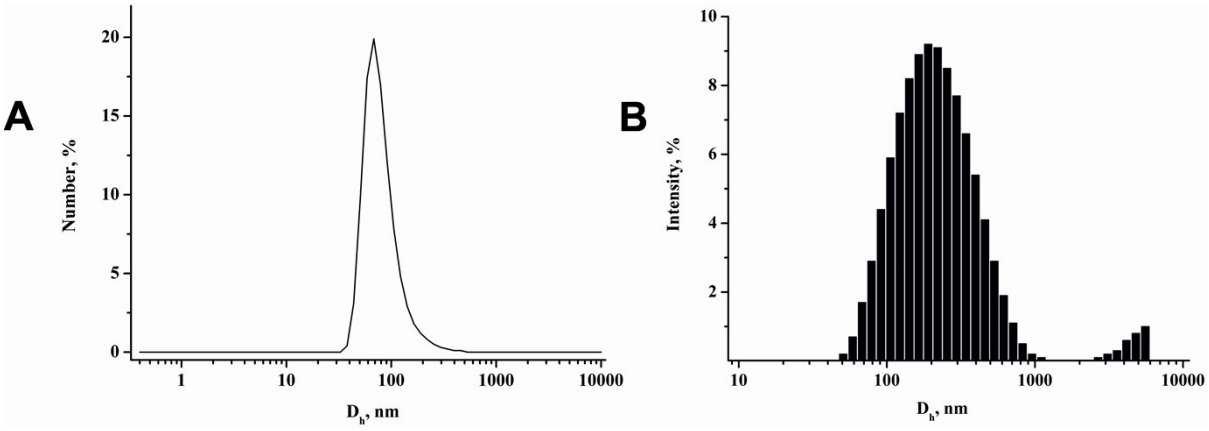

Fig. S7 DLS data on the number (a) and intensity (b) of gold nanoparticles stabilized by PVP in H_2O.