Supplementary Information

Development of coated-wire silver ion selective electrodes on the paper using conductive films of silver nanoparticles

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Content

(a) (b)

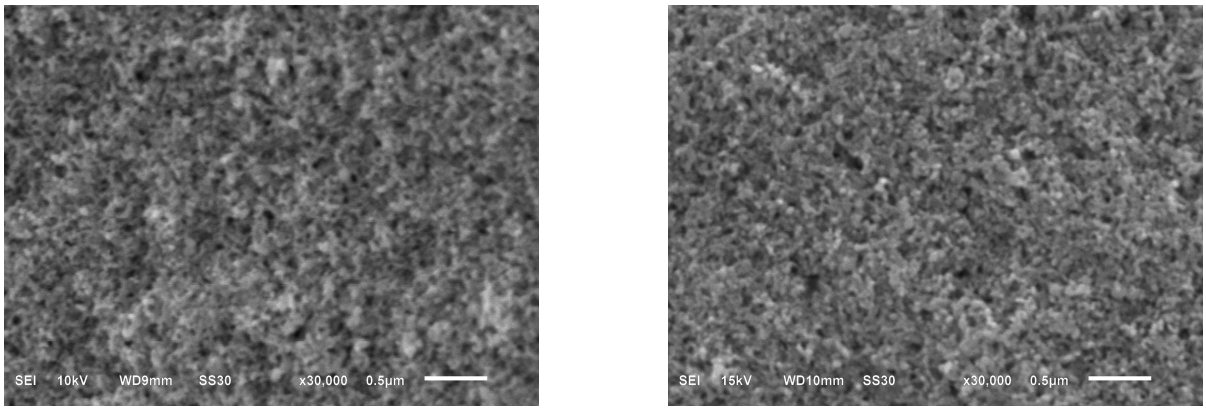

Fig. S1 SEM images of the nano silver ink after (a) left in air for overnight (b) left in air for one week.

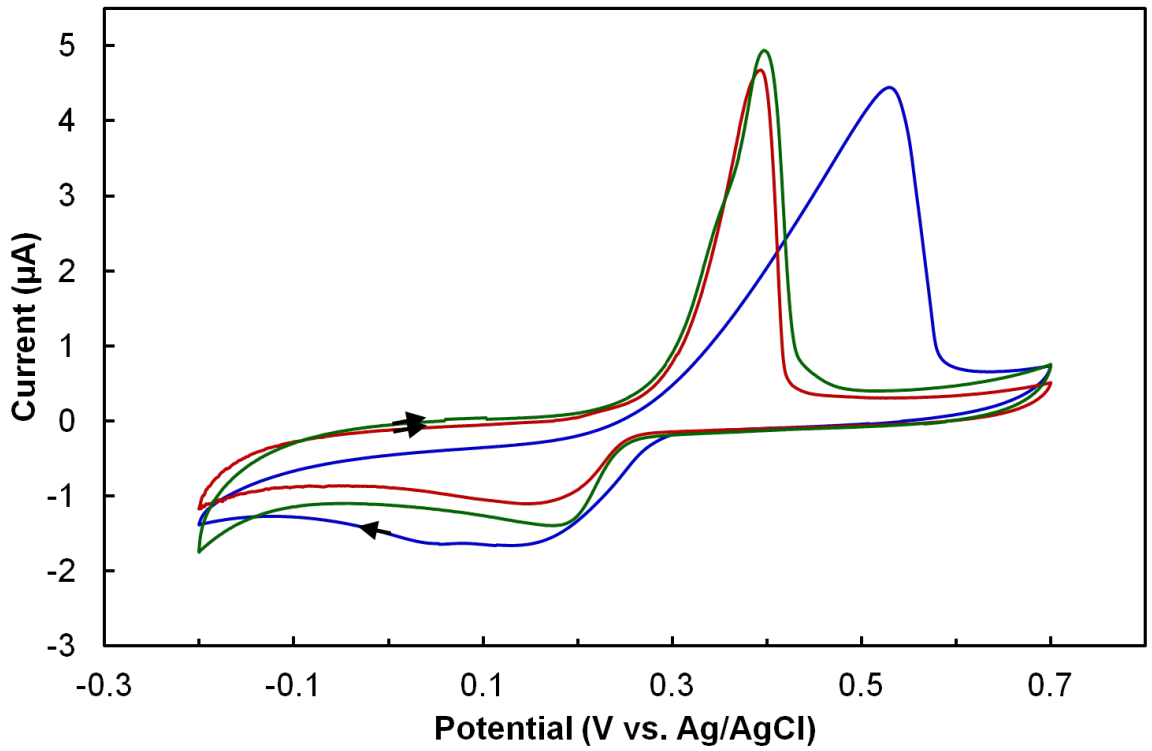

Fig. S2 Cyclic voltammograms of bare GC electrode in 0.01 mol/L KNO_3 solution containing 1.0×10^{-4} mol/L $AgNO_3$ (blue) and 0.01 mol/L KNO_3 solution containing 50 nm (red) and 100 nm (green) of silver nanoparticles colloid at a potential scan rate of 50 mV/s.

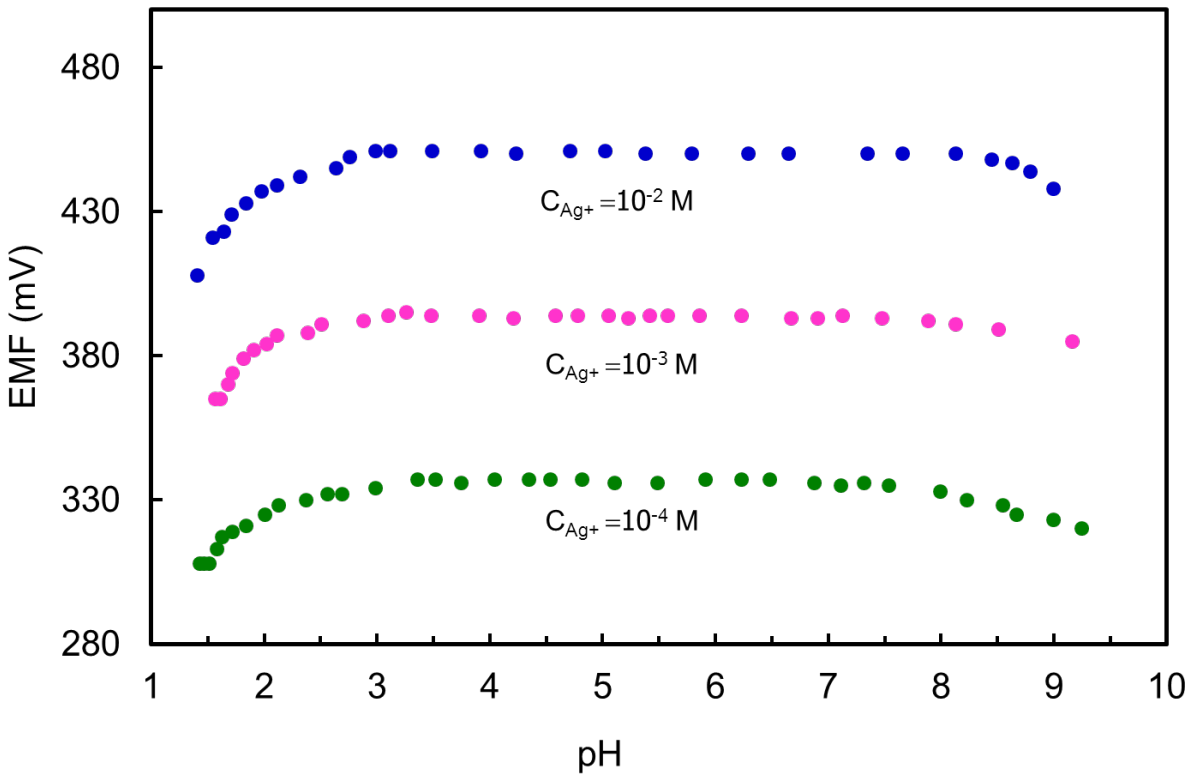

Fig. S3 Potential response of the coated-wire Ag-ISE fabricated from sintering nano silver at room temperature at variation of solution pH observed in three different Ag^+ concentrations.

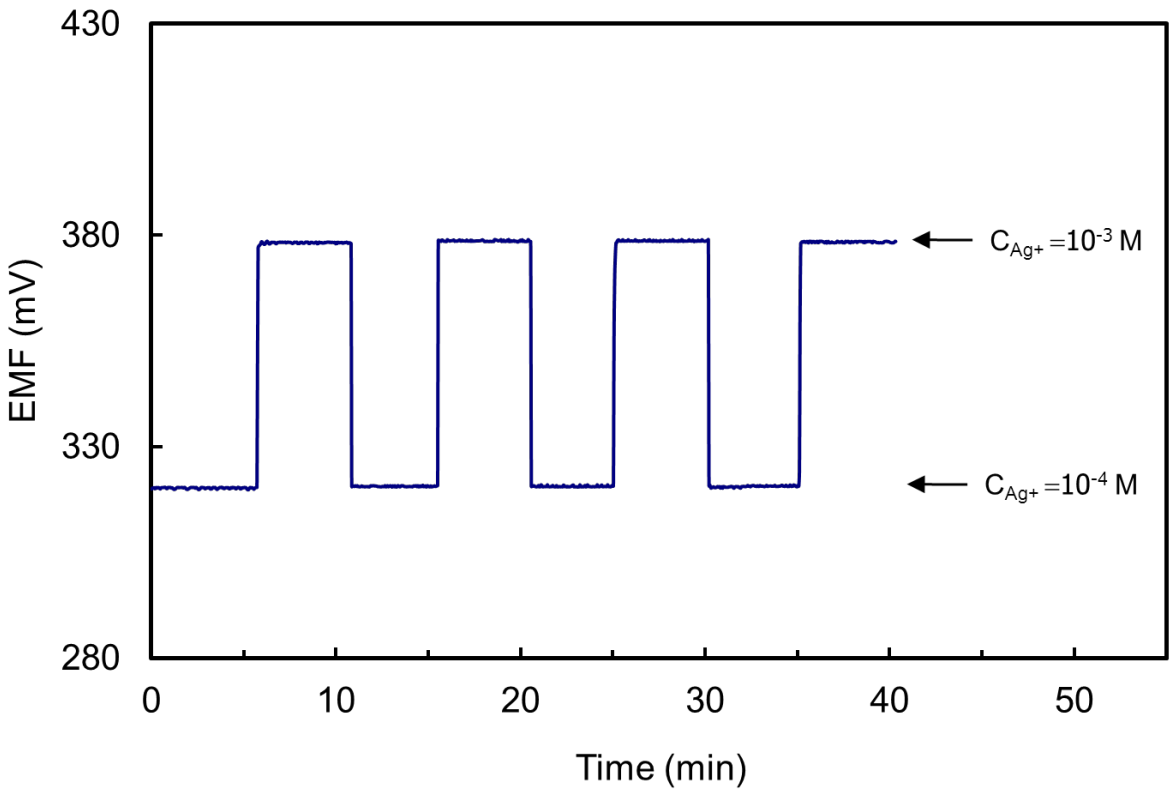

Fig. S4 Reversibility of the coated-wire Ag-ISE fabricated from sintering nano silver at room temperature at the concentration between 10^{-4} and 10^{-3} M.

Table S1 Comparison of the potentiometric parameters of the proposed the coated-wire Ag-ISEs with other Ag-ISEs reported previously.

Ref	Ionophore	Working concentration range (M)	Slope (mV decade)	pH range	Detection limit (M)	Response time (s)
[1][a]	25,27-Di(benzothiazolyl)-26,28-hydroxycalix[4]arene (**CU1**)	1.0×10^{-6} to 1.0×10^{-2}	59.7 ± 0.8	2.0 – 8.0	5.0×10^{-7}	<5 s
[2][a]	5,11,17,23-tetra-tert-butyl-25,27-dihydroxy-calix[4]arene-thiacrown-4	1.0×10^{-6} to 1.0×10^{-2}	53.8 ± 1.6	2.0 – 6.0	8.0×10^{-7}	5-10 s
[3][a]	*N,N′*-Bis(3-methyl-1-phenyl-4-benzylidine-5-pyrazolone)propylenediamine	1.0×10^{-6} to 1.0×10^{-1}	59.3	3.0 – 7.0	9.3×10^{-7}	5 s
[4][b]	4′-aminobenzo-15-crown-5 (B15C5)	2.7×10^{-7} to 1.0×10^{-1}	58.5	3.0 – 9.0	1.0×10^{-8}	~15 s
[5][b]	2-acetylbenzimidazole benzoylhydrazone	1.1×10^{-7} to 1.0×10^{-3}	61.2 ± 0.5	3.5 – 8.5	7.0×10^{-8}	~3 s
[6][c]	2,c-8,c-14,c-20-tetrabutyl-4,6,10,12,16,18,22,24-octaacetyl-resorc[4]arene	1.0×10^{-5} to 1.0×10^{-1}	58.0 ± 1	1.5 – 6.0	1.0×10^{-8}	<20 s
[7][c]	hexadentate mixed azathioether crowns containing a 1,10-phenanthroline sub-unit	3.0×10^{-8} to 5.0×10^{-2}	58.8 ± 0.5	3.0 – 7.0	1.0×10^{-8}	<15 s
[8][c]	*N,N′*-Bis(2-thienylmethylene)-1,2-diaminobenzene	1.0×10^{-6} to 1.0×10^{-1}	59.7	5.0 – 9.0	6.0×10^{-7}	≤ 17 s
[9][c]	2-[(2-{2-[(2-carboxyphenyl)sulfanyl] ethoxy}ethyl)sulfanyl]benzoic acid	2.0×10^{-8} to 1.0×10^{-2}	59.0 ± 1	2.5 – 8.7	1.2×10^{-8}	-
[10][c]	Schiff base of [bis 5-(4-nitrophenyl azo)salisylaldimine] 1,8-diamino, 3,6-dioxo octan (BNSAO)	1.9×10^{-6} to 2.7×10^{-2}	56.2 ± 0.7	2.5 – 7.0	7.8×10^{-7}	~5 s
This work	25,27-Di(benzothiazolyl)-26,28-hydroxycalix[4]arene (**CU1**)	1.0×10^{-6} to 1.0×10^{-2}	59.7 ± 1.0	2.5 – 8.0	4.5×10^{-7}	5 s

[a]conventional PVC membrane electrode. [b]solid contact PVC membrane electrode. [c]coated-wire PVC membrane electrode.

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