A Compact and Low-cost Micro-total Analysis System Composed of Microchip Electrophoresis and Chemiluminescence Detection Manipulated by a Simple Subatmospheric Pressure Fluid-Driven Device

Table S-1. Peak height(h) and peak height enhancements (En) of metal ions with different sample loading time

Ions	0.5s	1.0s		2.0s		Linear correlation coefficient (R^2)
	h/mV	h/mV	En	h/mV	En	
Cr^{3+}	6.97	13.52	1.99	28.50	4.09	0.9992
Mn^{2+}	5.39	10.06	1.98	22.01	4.08	0.9976
Co^{2+}	8.85	17.80	1.99	35.29	3.99	0.9999
Cu^{2+}	6.14	12.10	1.98	24.41	3.98	0.9999
Ni^{2+}	4.52	8.94	1.98	17.60	3.89	0.9999
Zn^{2+}	4.25	8.40	1.97	16.40	3.86	0.9997
Au^{3+}	6.84	13.40	1.96	26.40	3.86	0.9998
Pt^{2+}	4.28	9.32	1.95	16.40	3.83	0.9942
Pb^{2+}	3.27	7.28	1.94	12.50	3.82	0.9916

Table S-2. The effect of resident time on the resolution and separation efficiency at different vacuum applied on W reservoir

$V_a{}^a$ (mbar)	-4		-8		-12		-18		-24		-30		-36	
$T_R{}^b$ (s)	3.00		2.41		1.73		1.30		1.04		0.87		0.72	
ions	R^c	N^d	R	N	R	N	R	N	R	N	R	N	R	N
Cr^{3+}	0.00	152	0.00	213	0.00	870	0.00	872	0.00	1630	0.00	1935	0.00	3841
Mn^{2+}	1.50	302	1.92	401	3.51	611	4.37	1255	9.53	5076	9.93	5357	10.49	5747
Co^{2+}	1.30	288	1.41	628	2.92	2041	4.38	2055	5.22	2542	5.54	5597	7.56	5952
Cu^{2+}	0.87	592	1.39	775	3.73	2362	5.13	4762	5.26	17341	7.35	24793	8.35	28571
Ni^{2+}	0.74	880	1.09	1158	1.70	2326	2.44	3922	4.41	16854	5.10	19108	6.23	63830
Zn^{2+}	0.63	3319	0.86	6993	2.05	7371	2.77	20979	4.34	45455	5.83	54545	6.69	88235
Au^{3+}	1.43	1485	1.96	3727	6.16	12295	8.15	13216	10.56	57692	15.40	71429	19.06	85714
Pt^{2+}	1.38	4724	1.64	13333	7.01	53571	7.14	60000	10.51	62500	11.05	111111	11.24	120000
Pb^{2+}	0.86	7143	1.54	13393	2.86	14423	3.45	26087	3.51	27523	5.84	115385	5.93	125000

[a] Applied vacuum, [b] Resident time, [c] Resolution, [d] Theoretical plate number

Table S-3. Analytical results of the tea digest solution

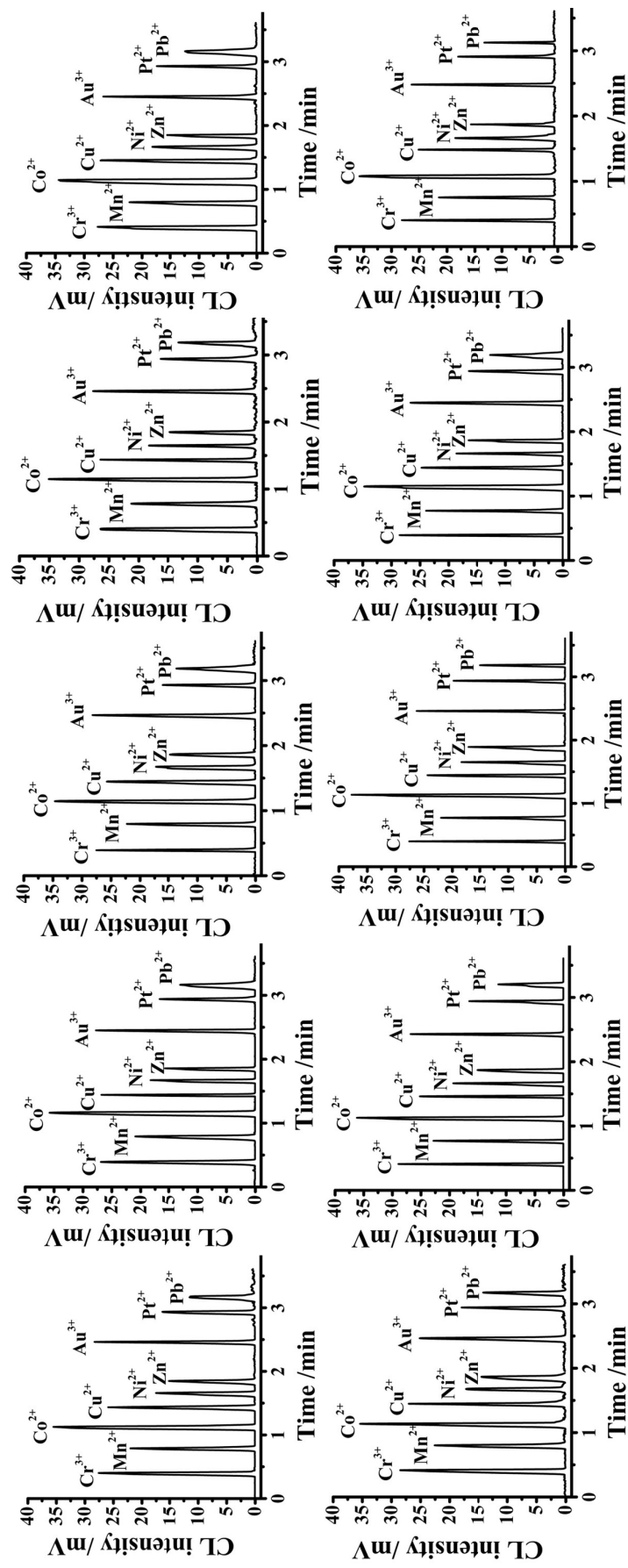| Metal ions	Found (mol/L)	Added (mol/L)	Total Found(mol/L)	Recovery (%)
Mn(II)	1.89×10^{-6}	2.00×10^{-6}	3.92×10^{-6}	101.5
Co(II)	3.64×10^{-8}	4.00×10^{-8}	7.55×10^{-8}	97.8
Cu(II)	3.03×10^{-8}	3.00×10^{-8}	6.10×10^{-8}	102.3
Zn(II)	4.25×10^{-7}	4.00×10^{-7}	8.15×10^{-7}	97.5
Pb(II)	3.34×10^{-7}	3.00×10^{-7}	6.25×10^{-7}	97.0

Figure S-1. Electropherograms of separation and detection of nine metal ions based on ten replicate injections to show the reproducibility of the proposed MCE-CL system. For other conditions, see Fig 7.