

Electronic Supplementary Information

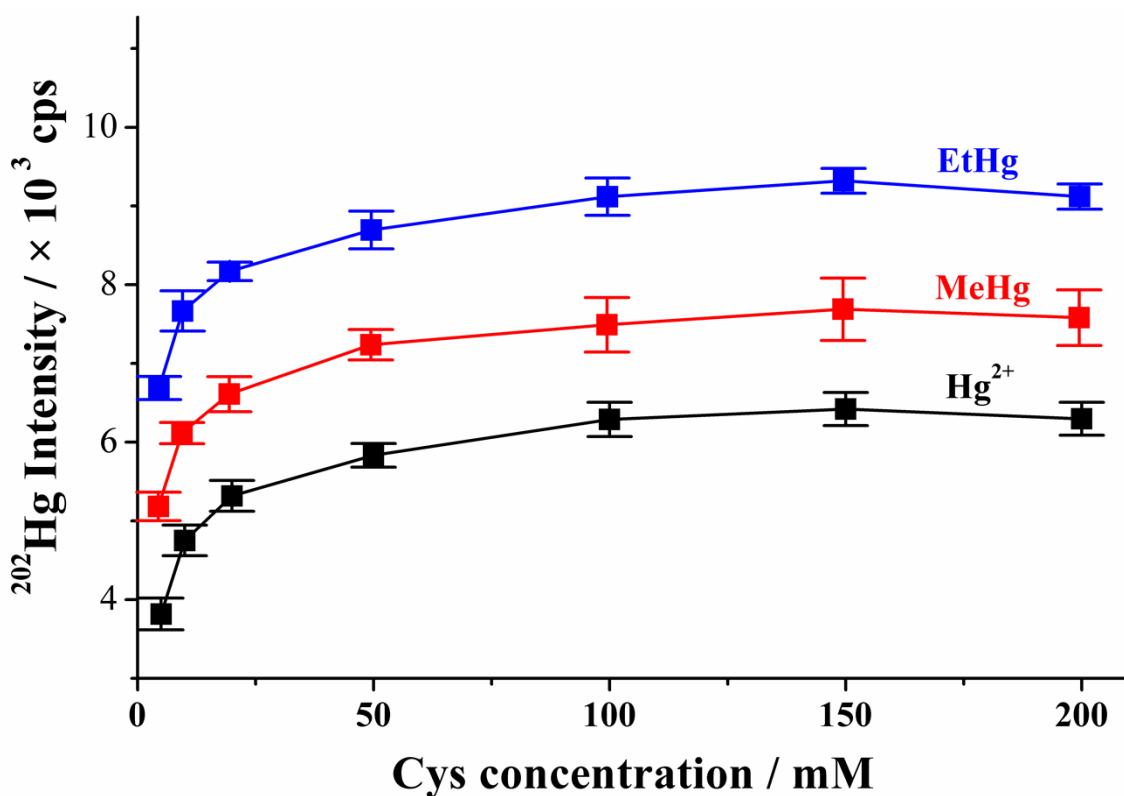


Fig. S1 The effect of L-cysteine concentration on the elution.

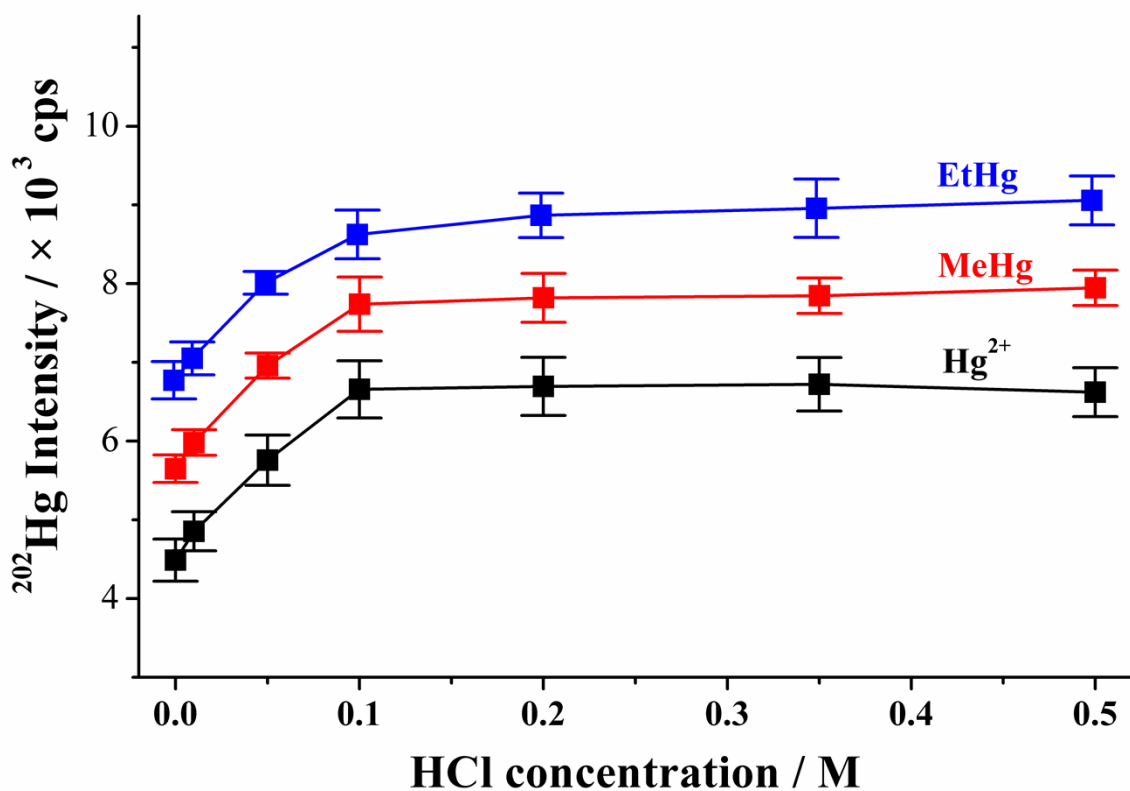


Fig. S2 The effect of HCl concentration on the elution.

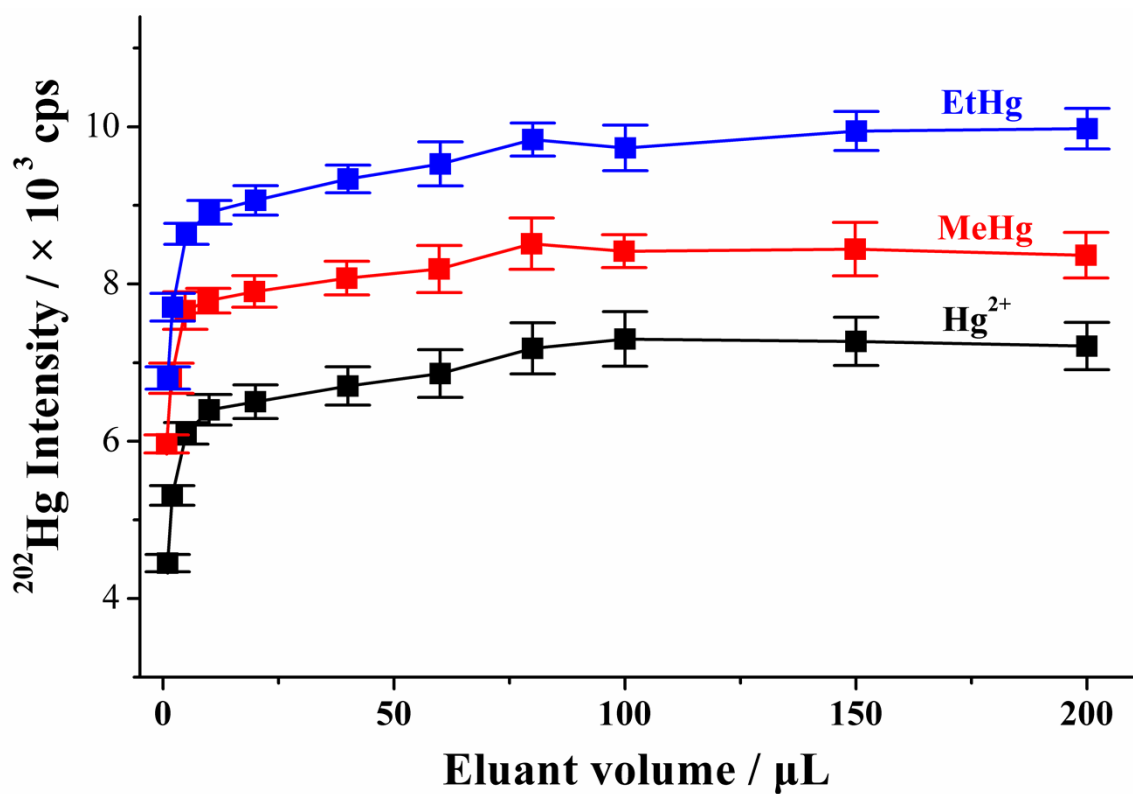


Fig. S3 The effect of the volume of the eluant on the elution.

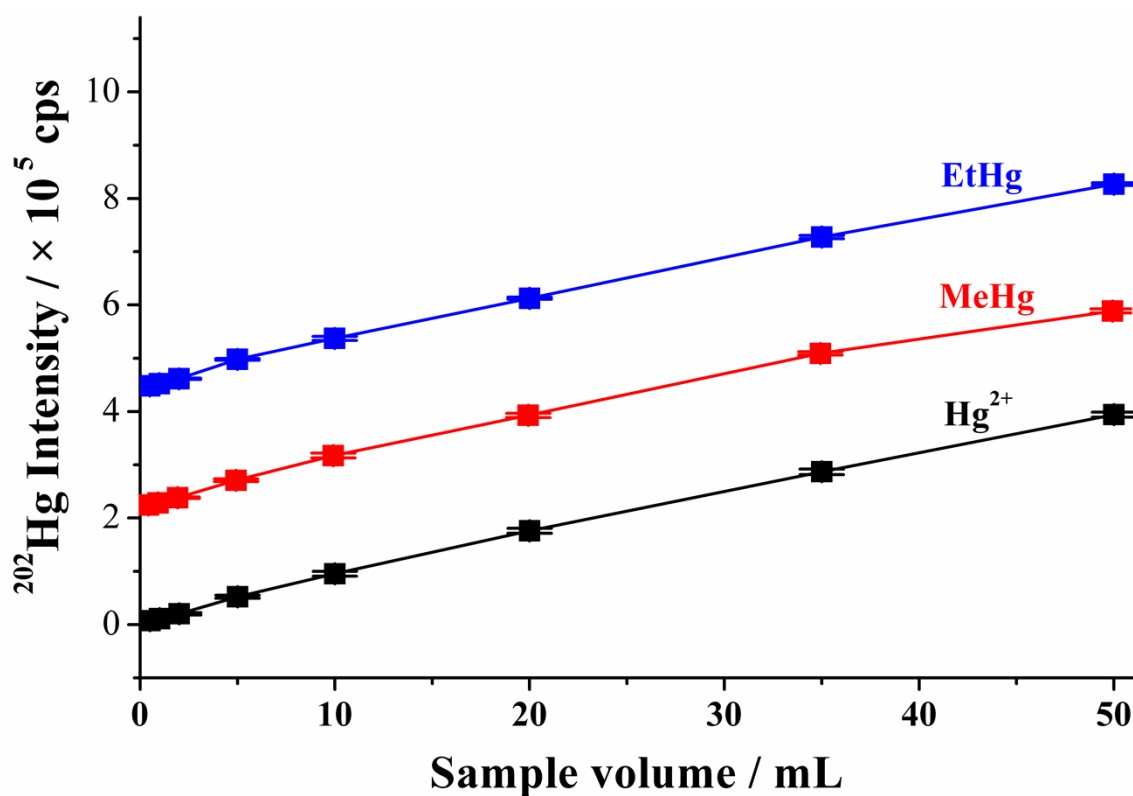


Fig. S4 The effect of sample volume on the preconcentration.

Table S1 Comparison with other preconcentration methods in terms of analytical time, LOD, EF, sample consumption and preconcentration time.

Analytical method with enrichment	Enriching material	Adsorption capacity (mg g ⁻¹)	Enrichment factor ^a	Retention time (min)	Detection limit (µg L ⁻¹)	Sample volume (mL)	Enriching time (min)	Ref.
HPLC-ICP-MS with SPE	Thiol-functionalized silica microspheres	Hg ²⁺ : 27.4 MeHg: 62.1 EtHg: 59.6	Hg ²⁺ : 830 MeHg: 916 EtHg: 883	Hg ²⁺ : 1.9 MeHg: 3.2 EtHg: 7.4	Hg ²⁺ : 0.000019 MeHg: 0.000013 EtHg: 0.0000014	5	0.6	This work
AFS with SPE	Thiol-rich polyhedral oligomeric silsesquioxane	MeHg: 46.7 Hg ²⁺ : 12.9	MeHg: 9.3 Hg ²⁺ : 8.9	-	MeHg: 0.004 Hg ²⁺ : 0.002	4	43	1
CVAAS with SPE	2-(3-(2-Aminoethylthio)-propylthio)-ethanamine modified silica	-	50	-	Hg ²⁺ : 0.035	10	>1.8	2
CE-UV with SPE	3-Mercaptopropyltrimethoxysilane	-	10	MeHg: 9.1 PhHg: 9.6 Hg ²⁺ : 14.6	MeHg: 11.9 PhHg: 7.4 Hg ²⁺ : 3.4	1	>4.3	3
AAS with SPE	Thiol-functionalized metal-organic framework nanocomposite	Hg ²⁺ : 210	Hg ²⁺ : 167	-	Hg ²⁺ : 0.02	500	>3	4
CVAAS with SPE	Ethylene glycol bis-mercaptoacetate modified 3-(trimethoxysilyl)-1-propanethiol coated magnetic nanoparticles	Hg ²⁺ : 41.6	Hg ²⁺ : 291	-	Hg ²⁺ : 0.01	-	-	5
CVAAS with SPE	Thiodiethanethiol modified silica coated magnetic nanoparticles	Hg ²⁺ : 68.1	Hg ²⁺ : 285	-	Hg ²⁺ : 0.004	300	30	6
CVAAS with SPE	2-(2'-Benzothiazolylazo)-p-cresol functionalized polystyrene-divinylbenzene resin	-	Hg ²⁺ : 46	-	Hg ²⁺ : 0.011	100	18.6	7
CVAAS with SPE	Oxidized carbon nanotubes	Hg ²⁺ : 3.2	Hg ²⁺ : 150	-	Hg ²⁺ : 0.002	200	>3	8
AFS with SPE	Silver modified magnetic carbon nanotubes	-	Hg ²⁺ : 125	-	Hg ²⁺ : 0.03	500	>20	9
AFS with SPE	Silver and gold nanoparticle membrane filters	-	-	-	Hg ²⁺ : 0.004	100	-	10
AFS with SPE	Magnetic gold nanoparticle microspheres	Hg ²⁺ : 2.6	Hg ²⁺ : 30	-	Hg ²⁺ : 0.0015	200	>18	11
ICP-OES with SPE	N-(pyridin-2-ylmethyl)ethanamine coated magnetic nanoparticles	Hg ²⁺ : 147	-	-	Hg ²⁺ : 0.03	500	>17	12
CVAAS	Tetradecyl(trihexyl)phosphoniumchloride immobilized polystyrene-divinylbenzene resin	-	Hg ²⁺ : 51	-	Hg ²⁺ : 0.0023	40	5.5	13

CVAAS	1,3-Bis(2-ethoxyphenyl)triazene modified octadecyl silica membrane disks	Hg ²⁺ : 98.9	Hg ²⁺ : 380	-	Hg ²⁺ : 0.011	1000	21.7	14
HPLC-ICP-MS with SPE	Anion exchange column	-	Hg ⁺ : 1025 MeHg: 1084 EtHg: 1108 Hg ²⁺ : 1046	Hg ⁺ : 0.7 MeHg: 1.1 EtHg: 2.2 Hg ²⁺ : 3.9	Hg ⁺ : 0.000015 MeHg: 0.00001 EtHg: 0.000009 Hg ²⁺ : 0.000016	6	1.5	15
HPLC-ICP-MS with flow injection displacement sorption	FIDS with Cellulose acetate fiber	-	80	MeHg: 8.6 EtHg: 11.6 PhHg: 13.0 Hg ²⁺ : 16.9	1-2.5	4	1	16
HPLC-ICP-MS with CPE	Triton X-114	-	MeHg: 18 PhHg: 46 Hg ²⁺ : 57	MeHg: 6.2 EtHg: 7.7 PhHg: 9.2 Hg ²⁺ : 13.8	MeHg: 0.01 PhHg: 0.008 Hg ²⁺ : 0.006	25	>20	17
HPLC-ICP-MS with CPE	Triton X-114	-	MeHg: 21 Hg ²⁺ : 42	MeHg: 4.2 Hg ²⁺ : 5.1	MeHg: 0.01 Hg ²⁺ : 0.004	25	>20	18
HPLC-UV with LLME	1-Hexyl-3-methylimidazolium hexafluorophosphate	-	MeHg: 114 PhHg: 106 Hg ²⁺ : 107	MeHg: 9.7 PhHg: 13.2 Hg ²⁺ : 19.6	MeHg: 1.0 PhHg: 1.9 Hg ²⁺ : 0.3	5	>9	19
HPLC-ICP-MS with LLME	Carbon tetrachloride	-	MeHg: 138 Hg ²⁺ : 350	MeHg: 10.6 Hg ²⁺ : 12.4	MeHg: 0.008 Hg ²⁺ : 0.001	5	>15	20
HPLC-ICP-MS with LLME	Methylimidazolium hexafluorophosphate	-	Hg ²⁺ : 760 MeHg: 115 EtHg: 235	Hg ²⁺ : 2.0 MeHg: 2.8 EtHg: 5.6	Hg ²⁺ : 0.001 MeHg: 0.007 EtHg: 0.005	5	>10	21
CVAAS with LLME	Methyltrioctylammonium thiosalicylate	-	MeHg: 200 Hg ²⁺ : 310	-	MeHg: 0.4 Hg ²⁺ : 0.03	10	>22	22
HPLC-ICP-MS with SPE	Cubical foam immobilized with sodium diethyldithiocarbamate	-	100	Hg ²⁺ : 2.4 MeHg: 2.8 EtHg: 4.0 PhHg: 9.0	Hg ²⁺ : 0.005 MeHg: 0.005 EtHg: 0.008 PhHg: 0.01	500	250	23

HPLC-UV with SPE	C ₁₈	-	200	MeHg: 5.9 PhHg: 7.0 Hg ²⁺ : 9.0	MeHg: 29 PhHg: 33 Hg ²⁺ : 27	50-500	12.5-125	²⁴
HPLC-ICP-MS with SPE	C ₁₈	-	MeHg: 6 Hg ²⁺ : 10	MeHg: 2.4 Hg ²⁺ : 1.9	MeHg: 0.00002 Hg ²⁺ : 0.00007	20	Unknown	²⁵
HPLC-AFS with SPE	C ₁₈	-	1000	MeHg: 9.4 EtHg: 13.6 Hg ²⁺ : 18.4 PhHg: 25.4	MeHg: 4.3 EtHg: 1.4 Hg ²⁺ : 0.8 PhHg: 0.8	100-500	20-100	²⁶
HPLC-UV with SPE	C ₁₈ modified with 1,3-bis(2-cyanobenzene) triazene	-	100	Hg ²⁺ : 8.6 MeHg: 9.6 PhHg: 10.4	Hg ²⁺ : 1.3 MeHg: 1.0 PhHg: 0.8	250	12.5	²⁷
HPLC-UV with SPE	C ₁₈	-	100	MeHg: 5.4 PhHg: 6.5 Hg ²⁺ : 8.5	MeHg: 0.06 PhHg: 0.08 Hg ²⁺ : 0.07	10-250	1-25	²⁸
HPLC-ICP-MS with SPE	C ₁₈	-	MeHg: 31.2 Hg ²⁺ : 27.8 EtHg: 23.9	MeHg: 2.5 Hg ²⁺ : 5.7 EtHg: 9.8	MeHg: 0.003 Hg ²⁺ : 0.003 EtHg: 0.003	100	50	²⁹
IC-CVAAS with SPE	C ₁₈ and cation exchange column	-	MeHg: 200-300 EtHg: 200-300 Hg ²⁺ : 700	MeHg: 2.5 EtHg: 3.6 Hg ²⁺ : 6.8	MeHg: 50 EtHg: 20 Hg ²⁺ : 10	10-100	2.5-25	³⁰
HPLC-ICP-MS with SPE	Cation exchange column	-	1250	Hg ²⁺ : 0.7 MeHg: 1.0 EtHg: 2.1	Hg ²⁺ : 0.00004 MeHg: 0.00002 EtHg: 0.000008	30	3.5	³¹

Abbreviations: clond point extraction (CPE); liquid-liquid microextraction (LLME); solid phase extraction (SPE); monomethylmercury (MeHg); ethylmercury (EtHg); phenylmercury (PhHg); inductively coupled plasma mass spectrometry (ICP-MS); high performance liquid chromatography (HPLC); Ion exchange chromatography (IC); capillary electrophoresis (CE); ultra-violet detection (UV); cold vapor atomic absorption spectrometry (CVAAS); atomic fluorescence absorption (AFS); inductively coupled plasma optical emission spectrometry (ICP-OES).

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