Supporting information

An *in-situ* pre-concentration method of mercury based on solid phase extraction technology and its application in seawater mercury isotope analysis

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Table S1 MC-ICPMS operating parameters

Parameters	Values
Inlet System	
Cool Gas (L/min)	16.00
Aux Gas (L/min)	0.80
Sample Gas (L/min)	0.035
Add. Gas 1 (L/min)	0.30
X - Pos (mm)	-0.190
Y - Pos (mm)	3.360
Z - Pos (mm)	-1.380
RF power (W)	1200
Source Lenses	
Extraction (V)	-2000.0
Focus (V)	-599.0
X-Defl (V)	0.29
Y-Defl (V)	-2.19
Shape (V)	195.0
Rot Quad 1 (V)	0.00
Source Offset (V)	-2.00
Zoom Optics	
Focus Quad (V)	10.00
Dispersion Quad (V)	0.00

Table S2 Sample information for South China Sea

Sample ID	Station	Longitude	Latitude	Depth (m)	Volume (L)	Recovery (%)	Hg (pM)	δ^{202}Hg (‰)	Δ^{199}Hg (‰)	Δ^{200}Hg (‰)
1	J8	113.5	18	5	35.15	98.2	0.72	-0.26	0.27	0.14
2	J8	113.5	18	50 (DCM)	34.4	97.6	0.76	-0.51	0.21	0.11
3	J8	113.5	18	75	36	92.8	0.71	-0.48	0.14	0.05
4	J8	113.5	18	100	35.2	99.6	0.71	-0.66	0.22	0.10
5	J8	113.5	18	200	33	94.5	0.75	-0.27	0.37	0.14
6	D24	114	12	5	35.05	95.8	0.55	-0.52	0.39	0.30
7	D24	114	12	75 (DCM)	35.7	93.8	0.55	-1.26	0.25	0.11
8	D24	114	12	100	35.55	96.9	0.75	-0.63	0.09	0.00
9	D24	114	12	200	35.6	98.9	0.59	-1.30	0.23	0.09

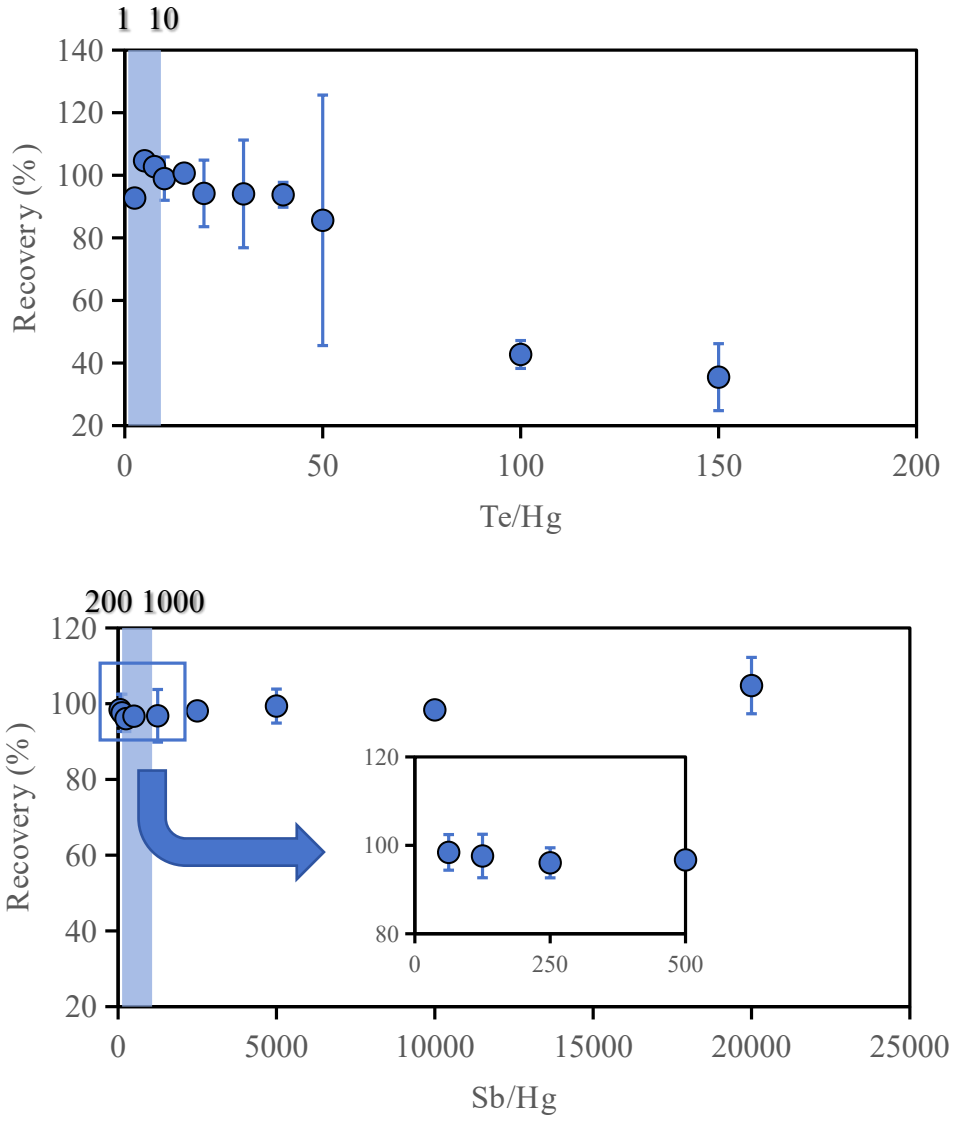
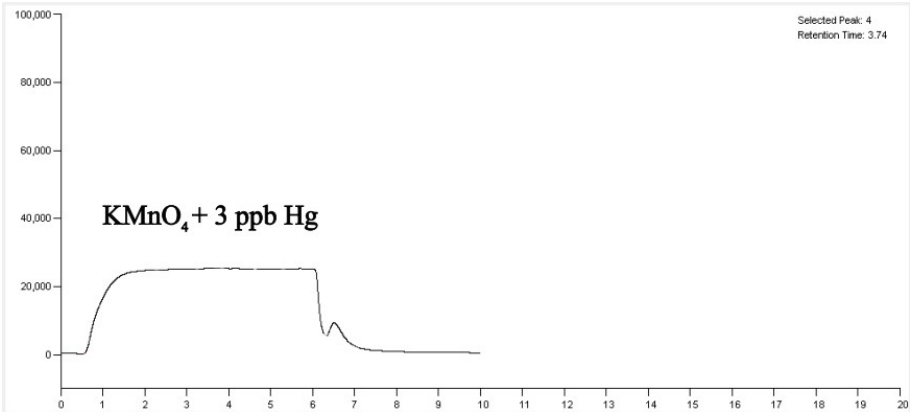
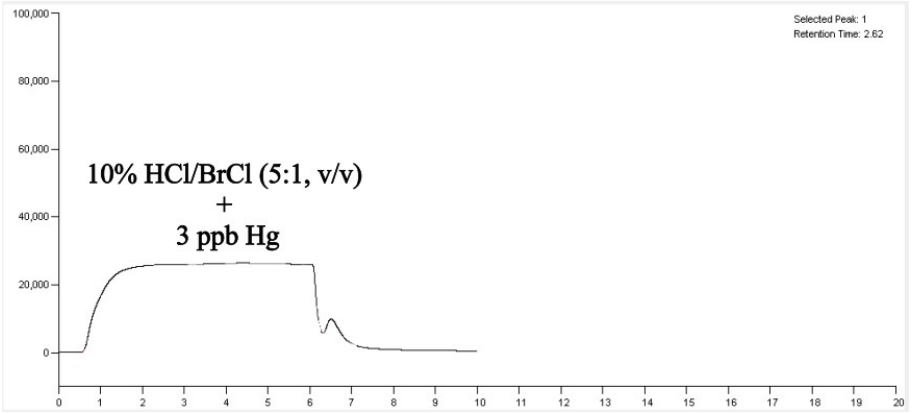
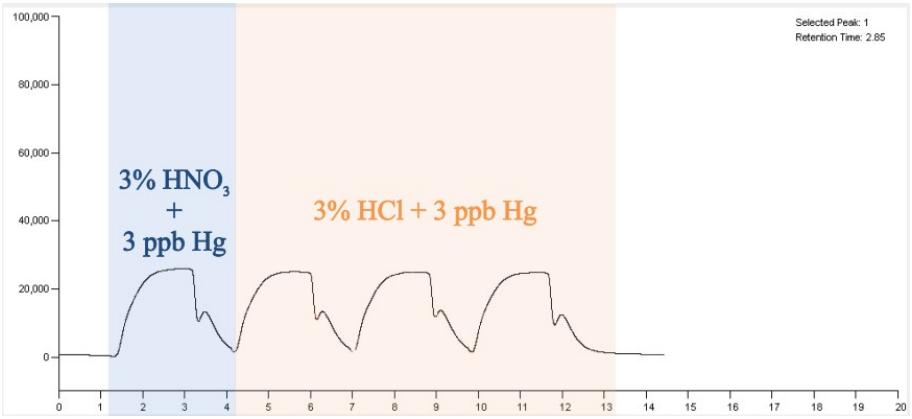
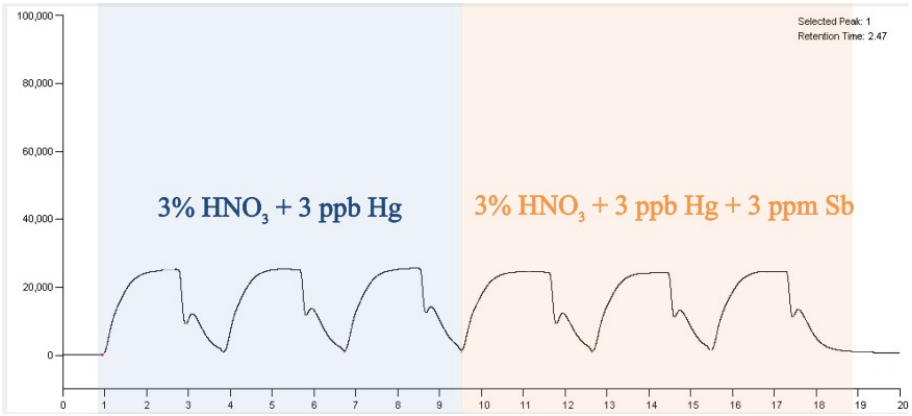


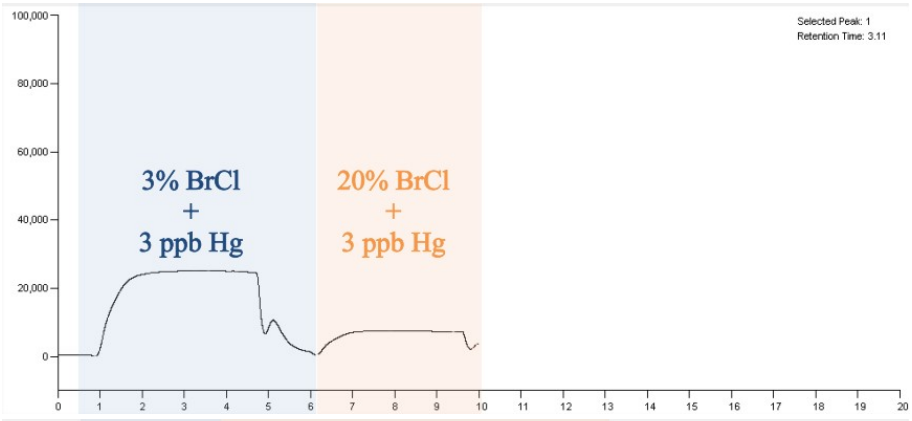
Fig. S1 Proportionally adding 3 ng/mL Hg standard solution and corresponding concentrations of Te and Sb standard solutions into ocean seawater. After fixing with bromine chloride for 12 hours, measure the mercury content and calculate the mercury recovery rate. The shaded area represents the mass ratio ranges of Te/Hg and Sb/Hg in seawater (1-10 and 200-1000), respectively.

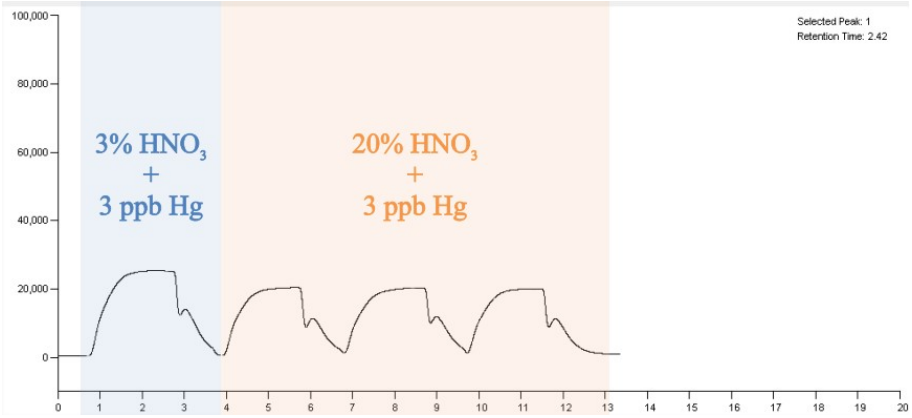

Selected Peak: 4
Retention Time: 3.74
KMnO4 + 3 ppb Hg

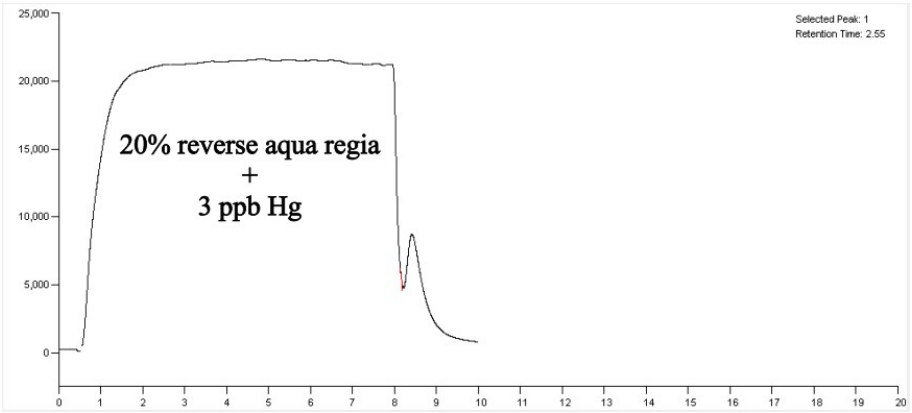

Selected Peak: 1
Retention Time: 2.62
10% HCl/BrCl (5:1, v/v)
+
3 ppb Hg

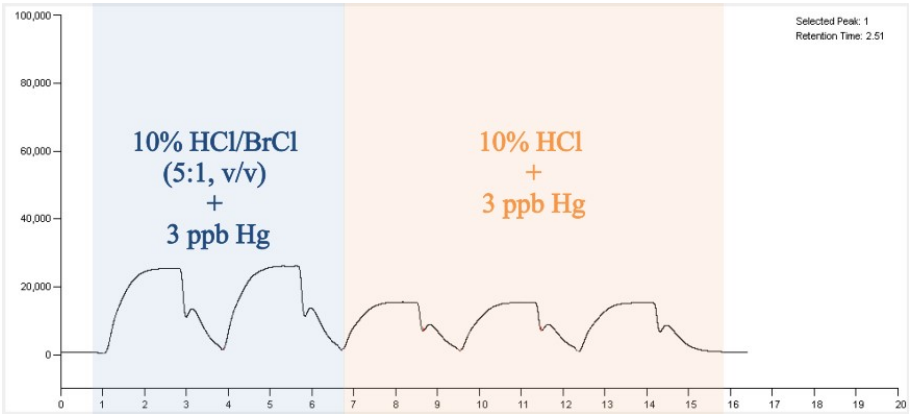

Selected Peak: 1
Retention Time: 2.85
3% HNO3
+
3 ppb Hg
3% HCl + 3 ppb Hg


Selected Peak: 1
Retention Time: 2.47
3% HNO3 + 3 ppb Hg
3% HNO3 + 3 ppb Hg + 3 ppm Sb


Selected Peak: 1
Retention Time: 3.11
3% BrCl
+
3 ppb Hg
20% BrCl
+
3 ppb Hg


Selected Peak: 1
Retention Time: 2.42
3% HNO3
+
3 ppb Hg
20% HNO3
+
3 ppb Hg


Selected Peak: 1
Retention Time: 2.55
20% reverse aqua regia
+
3 ppb Hg


Selected Peak: 1
Retention Time: 2.51
10% HCl/BrCl
(5:1, v/v)
+
3 ppb Hg
10% HCl
+
3 ppb Hg

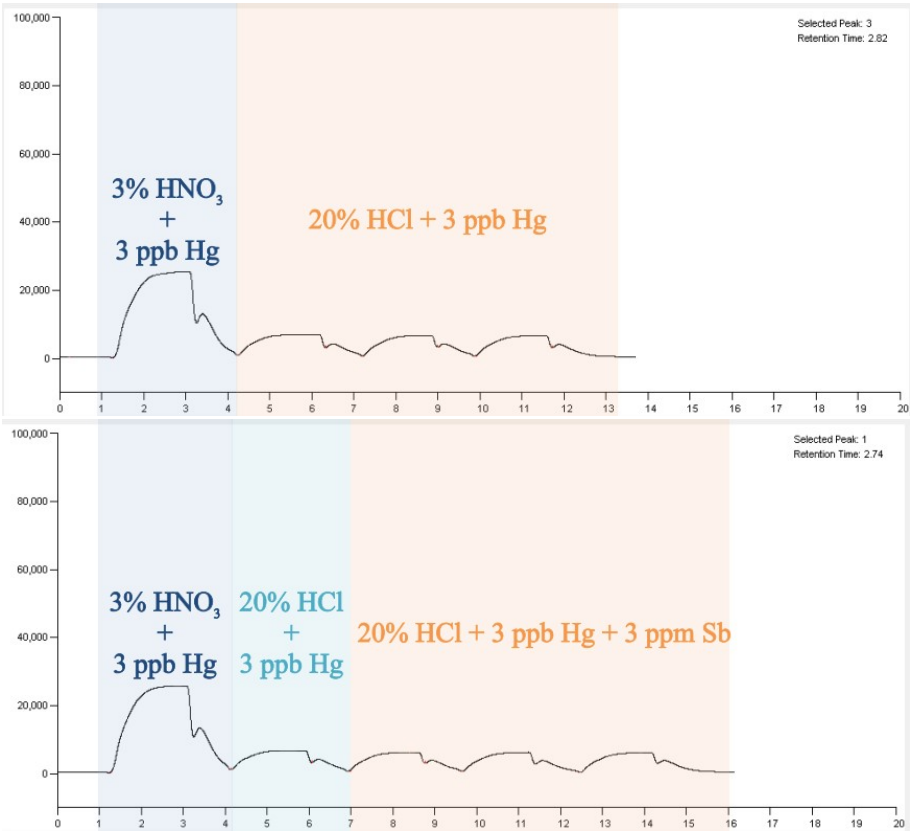


Fig. S2 The influence of eluent matrix on the mercury signal intensity.

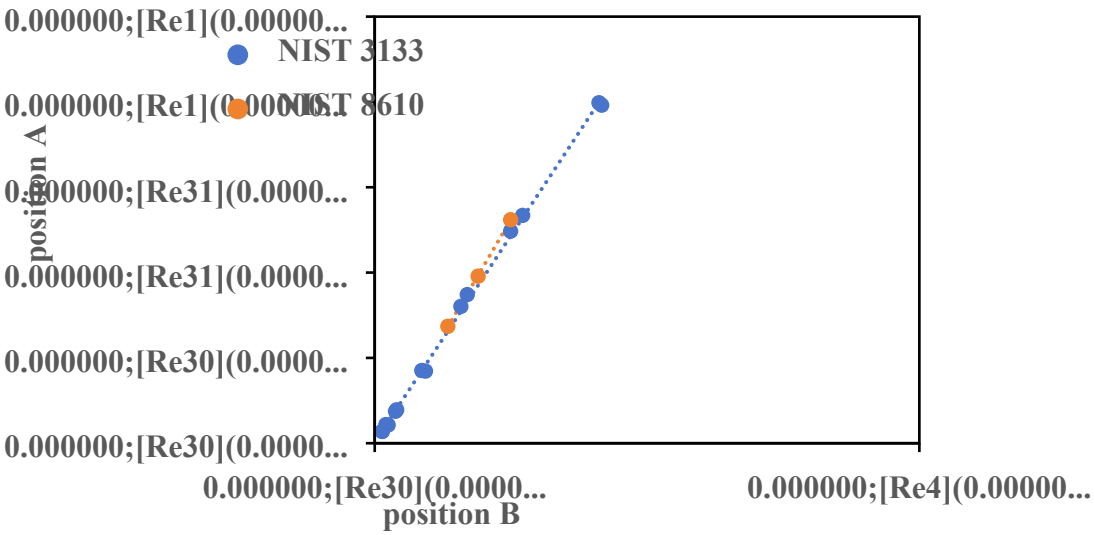


Fig. S3 Comparisons of ^{201}Hg signal intensity in the two channels.

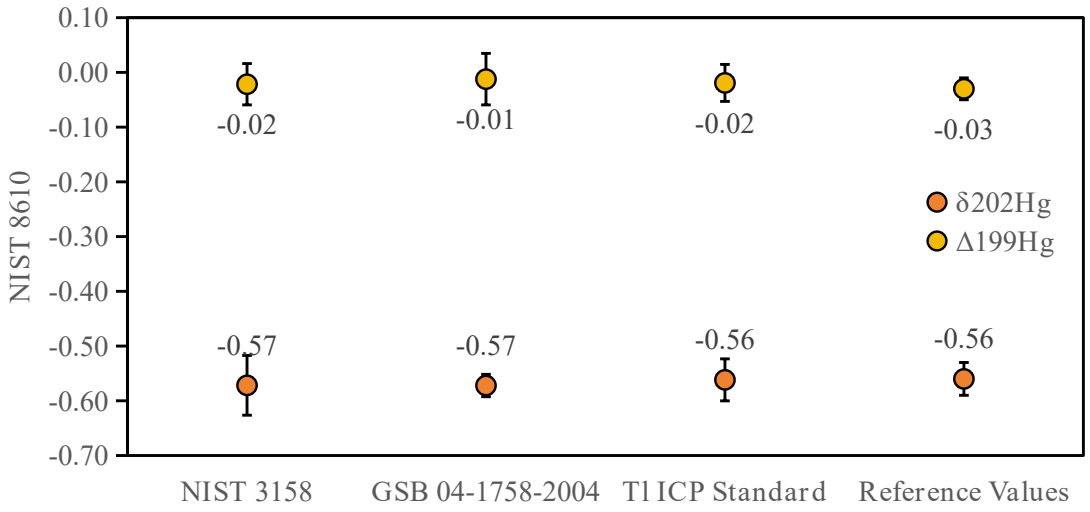


Fig. S4 Comparisons of Hg isotope compositions of NIST 8610 corrected by different Tl standards.