Electronic Supplementary Material (ESI) for Analytical Methods.

Supplementary information

Ultra-sensitive Sb speciation analysis in water samples by magnetic ionic liquid dispersive liquid-liquid microextraction and multivariate optimization

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Figure S1

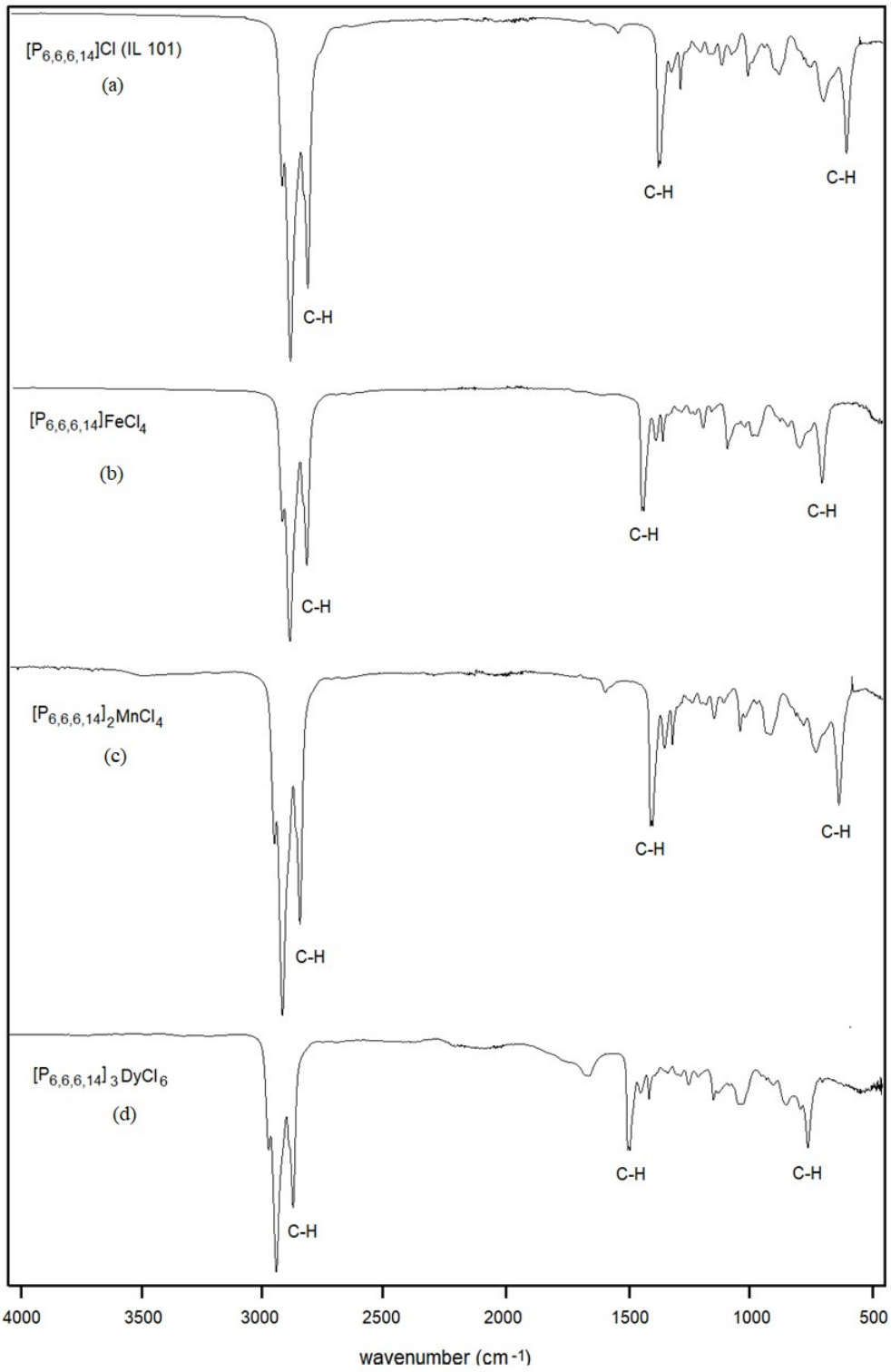


Fig. S1. FTIR spectra of (a) $[P_{6,6,6,14}]Cl$ and MILs studied in this work. (b) $[P_{6,6,6,14}]FeCl_4$, (c) $[P_{6,6,6,14}]_2MnCl_4$. (d) $[P_{6,6,6,14}]_3DyCl_6$.

Figure S2

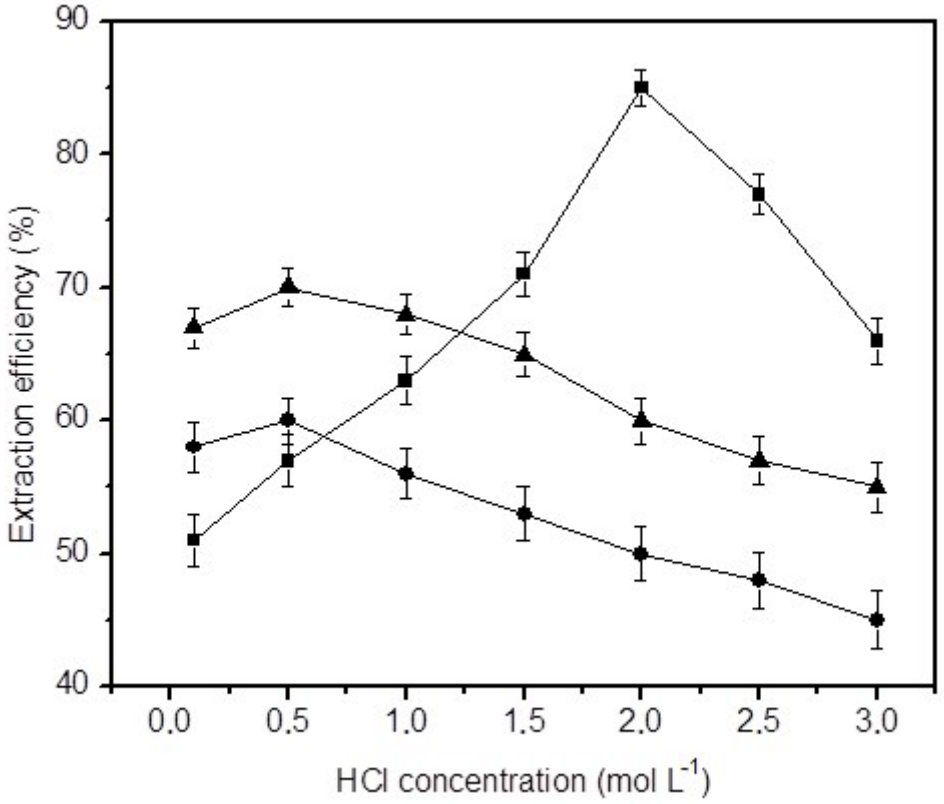


Fig. S2. Effect of hydrochloric acid concentration on Sb(III) extraction efficiency using $[P_{6,6,6,14}]FeCl_4$ (■), $[P_{6,6,6,14}]_3DyCl_6$ (▲) and $[P_{6,6,6,14}]_2MnCl_4$ (●) as extraction solvents. Other conditions were as mentioned in Table 1 (95% confidence interval, n = 6).

Figure S3

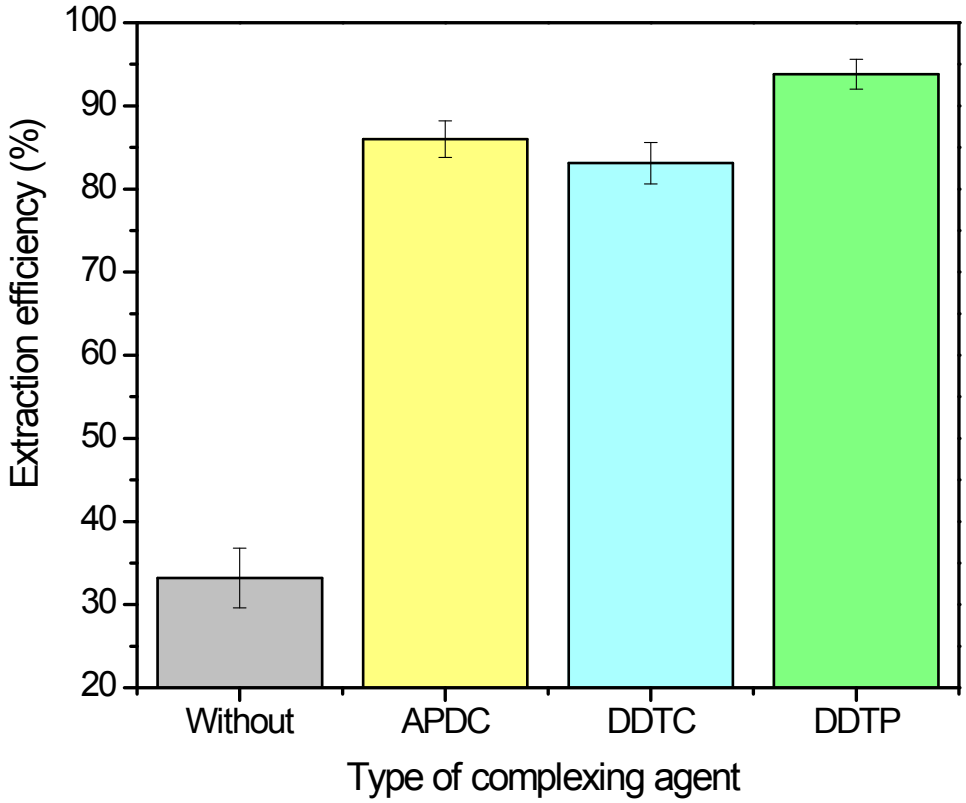


Fig. S3. E□ect of different complexing agents on Sb(III) extraction e□ciency (6 mL of sample at 2 mol L^{-1} HCl). ■ Without, ■ APDC, ■ DDTC and ■ DDTP. Other conditions were as indicated in Table 1 (95% confidence interval, n = 6).

Figure S4

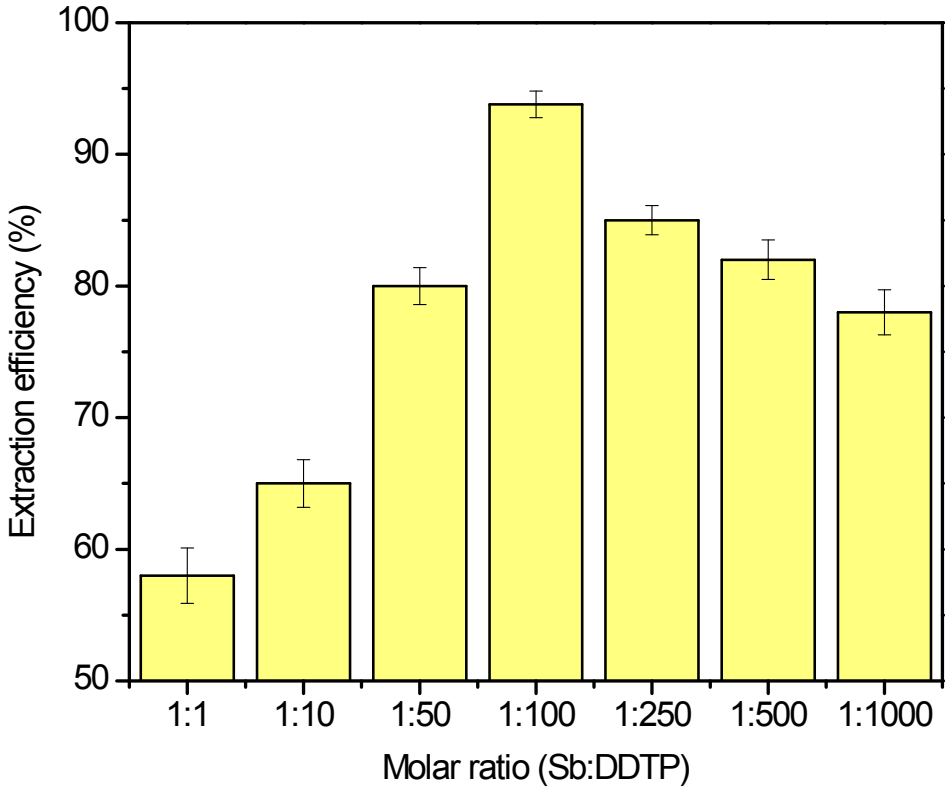
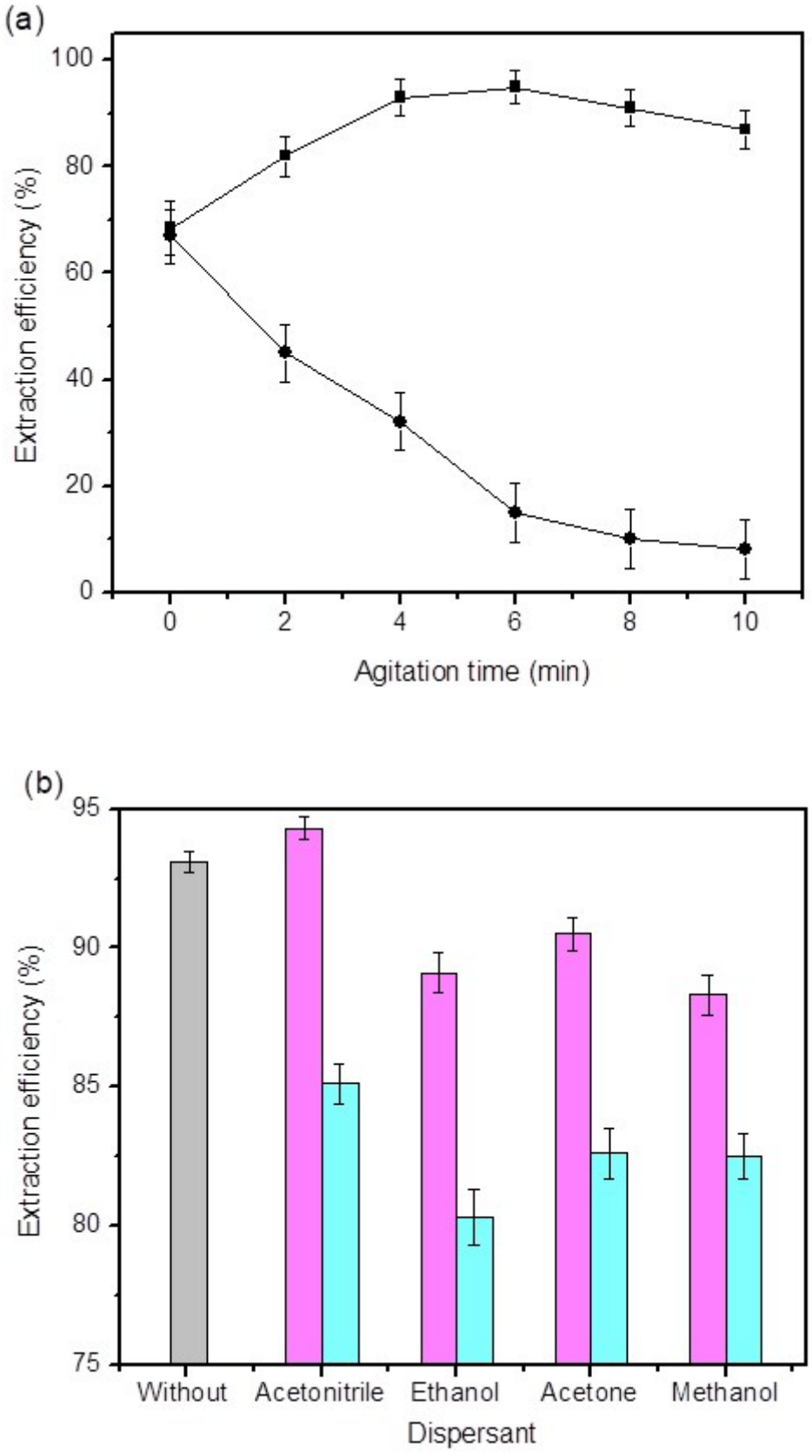


Fig. S4. Influence of Sb:DDTP molar ratio on Sb(III) extraction efficiency using $[P_{6,6,6,14}]FeCl_4$ as extracting phase. Other conditions were as mentioned in Table 1 (95% confidence interval, n = 6).

Figure S5


(a)
Extraction efficiency (%)
100
80
60
40
20
0
0
2
4
6
8
10
Agitation time (min)
(b)
Extraction efficiency (%)
95
90
85
80
75
Without
Acetonitrile
Ethanol
Acetone
Methanol
Dispersant

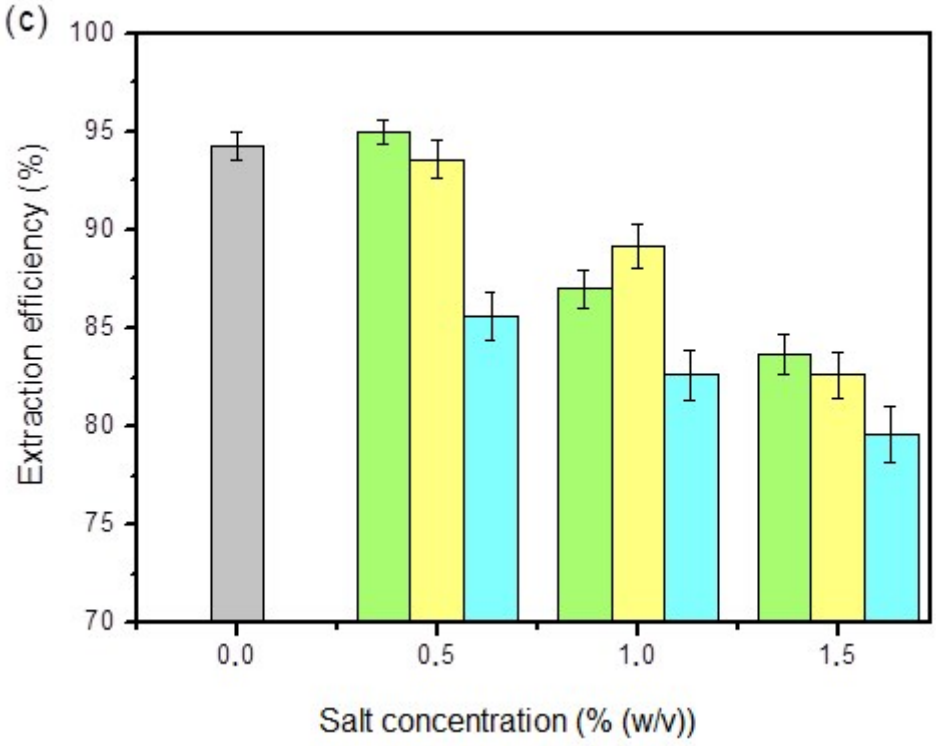


Fig. S5. Study of the categorical factors involved in the proposed method. (a) Type of agitation: (■) vortex and (●) ultrasound. (b) Dispersants volume: 25 µL and 50 µL.(c) Ionic strength: NaCl, $NaNO_3$ and $NaClO_4$. Other conditions are shown in Table 1 (95% confidence interval, n = 6).

Figure S6

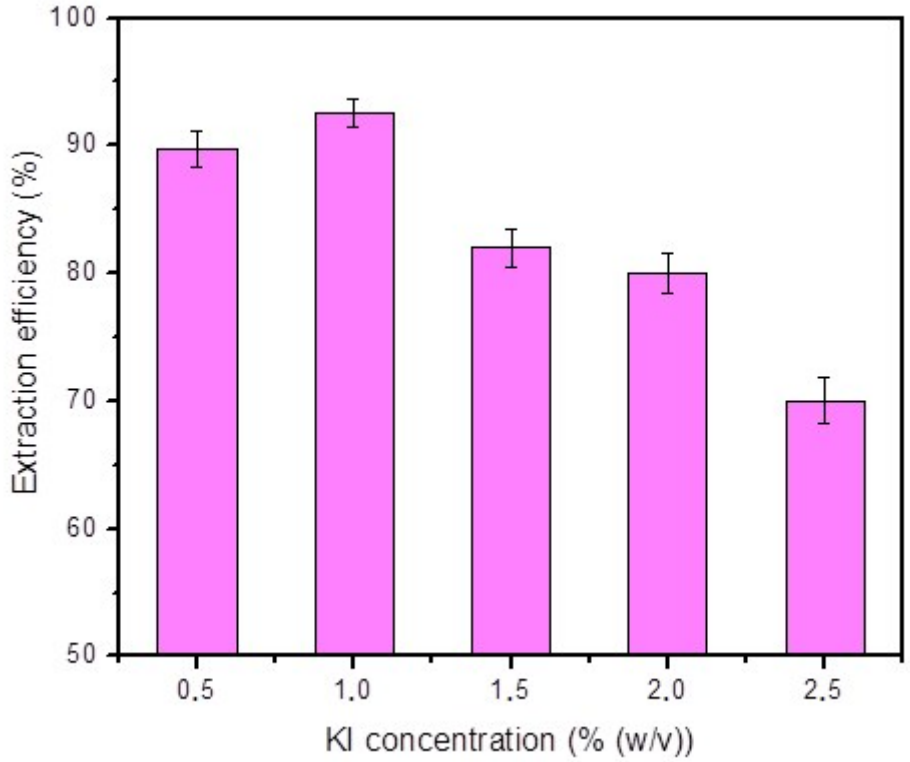


Fig. S6. Effect of KI concentration on Sb extraction efficiency of the MIL-DLLME method. Other conditions were as mentioned in Table 1 (95% confidence interval, n = 6).

Figure S7

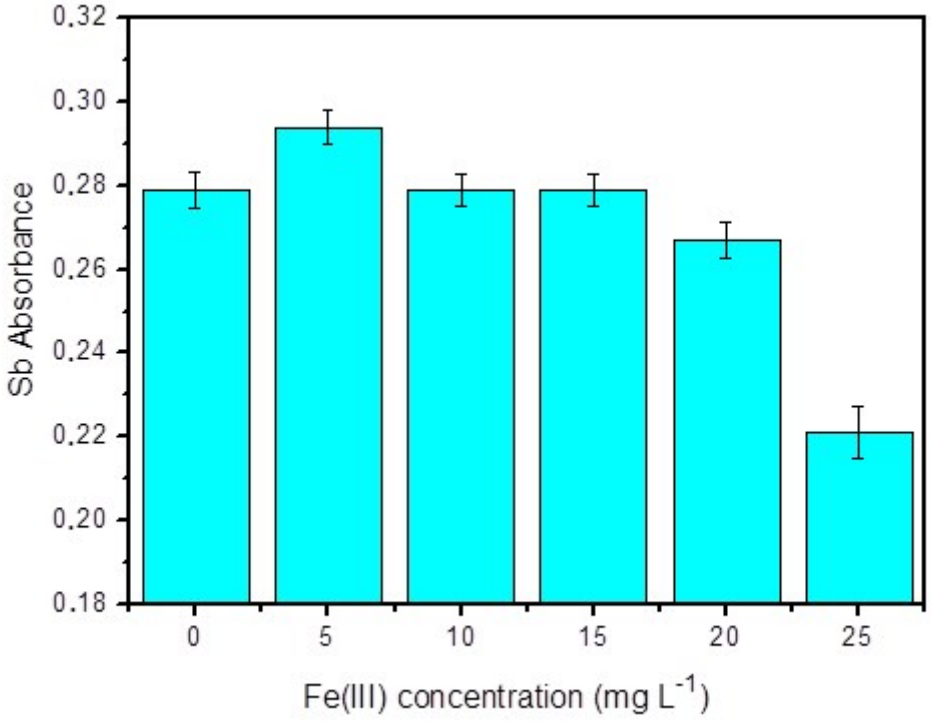


Fig. S7. Effect of Fe(III) concentration on Sb signal. A volume of 20 µL of 200 µg L^{-1} Sb aqueous standard solution was injected. ETAAS instrumental conditions were as indicated in Table 1 (95% confidence interval, n = 6).