

**Speciation analysis of antimony (III) and antimony (V) in water samples by dispersive liquid-liquid microextraction (DLLME) combined with electrothermal atomic absorption spectrometry**

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Dispersive liquid-liquid microextraction (DLLME) technique combined with electrothermal atomic absorption spectrometry (ET-AAS) was proposed for determination of antimony specie at very low concentration in water samples. N-benzoyl-N-phenylhydroxylamine (BPHA) was used as chelating agent for Sb(III), and chloroform and ethanol were used as extraction and disperser solvent, respectively. In order to determine the Sb(V) concentration, it reduced to Sb(III) by L-cysteine, then the concentration of Sb (V) was indirectly calculated by subtracting of Sb(III) from total antimony. The effect of various experimental parameters on the extraction and determination was investigated. Under the optimum conditions the calibration graph was linear over the range of 0.02- 0.8  $\mu\text{g L}^{-1}$ . The relative standard deviations (R.S.Ds.) were 3.8% for Sb(III) and 4.1% for total Sb ( $C = 0.4 \mu\text{g L}^{-1}$ ,  $n = 8$ ), respectively. The enrichment factor (EF) was 188 and the detection limits ( $3\sigma$ ) were  $0.005 \mu\text{g L}^{-1}$  for Sb(III) and  $0.008 \mu\text{g L}^{-1}$  for total Sb.

The developed method has been applied successfully to the determination of Sb(III) and Sb(V) in natural water samples.