SELENIUM AND ARSENIC DETERMINATIONS VIA HYDRIDE GENERATION
HEADSPACE SINGLE DROP MICROEXTRACTION (HS-SDME)
ELECTROTHERMAL ATOMIC ABSORPTION SPECTROMETRY

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In this study, headspace single drop microextraction (HS-SDME) method in combination with electro thermal atomic absorption spectrometry (ETAAS) with Zeeman-effect background correction was validated for separate determinations of selenium and arsenic in water samples. Arsenic and selenium species were converted to arsine and selenide in the presence of NaBH₄ in a closed 20 mL headspace vial and trapped onto 4μL drop of trapping agent in the tip of a microsyringe. Pd (II) for Se and APDC for As were selected as the acceptor phases. When the equilibrium was reached between the arsine (or selenide) in the headspace and microdrop suspended above the 10 mL solution in the closed HS vial, the drop was retracted back into the syringe and injected manually into graphite furnace for the determination. The analytical parameters of the method such as microextraction time, sampling temperature, NaBH₄ concentration, trapping agent concentration, pH of the medium, possible interference effects, analytical figures of merit have been investigated. Precision of the method in terms of inter-batch and intra-batch repeatability has been evaluated and method has been validated by analyzing certified reference materials (CRM) such as LGC 6011.

References