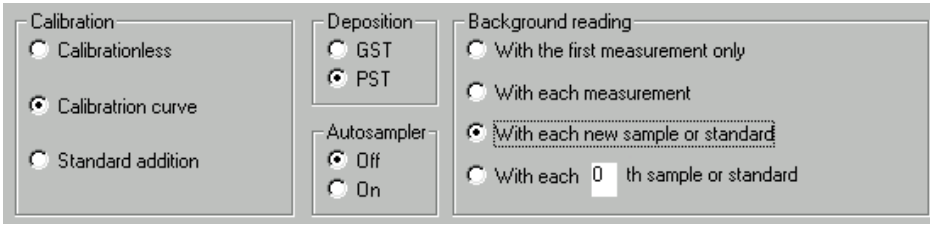


Application list No.	40
Title	Determination of total Arsenic in waters
Types of samples	All types of water samples
Principle	<p>The inorganic As(III) and As(V) species are electrochemically deposited from the flowing sample solution on the working electrode:</p> $\text{AsO}_3^{3-} + 6 \text{H}^+ = \text{As}^0 + 3 \text{H}_2\text{O} - 3 \text{e}^-$ $\text{AsO}_4^{3-} + 8 \text{H}^+ = \text{As}^0 + 4 \text{H}_2\text{O} - 5 \text{e}^-$ <p>The deposition is performed by applying a suitable constant potential. In the next step, the deposit is stripped galvanostatically, whereas the stripping chronopotentiogram is recorded and evaluated.</p>
Reagents	<p>§ KMnO_4, p.a. § Certified reference material for As(V)</p>
Solutions	<p>§ <i>R-1015</i>: Carrier electrolyte solution § KMnO_4, 0.01 mol/l: Reagent solution</p>
Standard solutions for the calibration curve	<p>The standard solutions are prepared in pure water from the certified reference material: Standard No. 1: 10 $\mu\text{g}/\text{dm}^3$ As(V) Standard No. 2: 50 $\mu\text{g}/\text{dm}^3$ As(V) Standard No. 3: 100 $\mu\text{g}/\text{dm}^3$ As(V) <i>Note: If appropriate, adjust the composition of the standard solutions to the sample!</i></p>
Standard solution for the additions	<p>The standard solution is prepared in pure water from the certified reference material: 100 $\mu\text{g}/\text{dm}^3$ As(V) <i>Note: If appropriate, adjust the composition of the standard solution to the sample!</i></p>
Sample preparation	<p><i>Sample:</i> Add dropwise KMnO_4 solution to the sample solution until it turns light violet for at least one minute.</p> <p><i>Blank sample:</i> The same procedure as that for the sample, just use water instead of the sample.</p>
Electrode	E-T/Au or E-TH/Au
Experimental parameters	<p>Potentiostatic mode</p> 

<p>Typical signal</p>	
<p>Data evaluation</p>	<p>Calibration curve or standard additions method</p>
<p>Metrological data</p>	<p>Concentration range: 0.5 to 500 $\mu\text{g}/\text{dm}^3$ As Reproducibility: 4.2 % at 50 $\mu\text{g}/\text{dm}^3$ As</p>
<p>Interferences</p>	<p>§ Some metal ions such as Cu(II), Sb(III), Bi(III), etc., may interfere at higher concentrations. These interferents should be removed with a strong acidic ion exchanger. § High contents of humic materials may decrease the sensitivity of the measurements.</p>
<p>Notes</p>	<p>§ Samples for higher Arsenic concentrations than given above should be suitably diluted. § By a suitable setting of the deposition potential (e.g. to -400 mV instead of -1600 mV), the As(III) species could selectively be deposited. Hence, there is a possibility for speciation measurements. Of course, the permanganate solution must not be added in this case and the calibration should be performed with standard solutions of As(III) !</p>