

<b>79-1 (2004)</b>	<b>Arsenic and compounds, except arsine (as As)</b>
<b>CAS N°: 7440-38-2</b>	<b>EINECS N°: 231-148-6</b>
<b>EC-LV (8 h): - Lowest European LV (8 h): 0,01 mg/m<sup>3</sup> Highest European LV (8 h): 0,20 mg/m<sup>3</sup></b>	<b>EC-STLV: - Lowest European STLV: 0,4 mg/m<sup>3</sup> Highest European STLV: 0,4 mg/m<sup>3</sup></b>

### SUMMARY OF THE METHOD

<b>Language:</b> English, French	<b>Reference:</b> <b>Workplace air - Determination of particulate arsenic and arsenic compounds and arsenic trioxide vapour - Method by hydride generation and atomic absorption spectrometry:</b> ISO 11041, ISO (1996).
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**Summary:** Air is drawn through a MCE filter and a sodium carbonate impregnated back-up pad mounted in an inhalable sampler. The arsenic compounds and the filters are dissolved with nitric acid, sulphuric acid and hydrogen peroxide and the solution is analysed by AAS after hydride generation, using either continuous flow hydride generation or flow injection analysis.

### SAMPLING

<b>Sampler type</b>	Samplers, designed to collect the inhalable fraction of airborne particles, complying with ISO 7708.
<b>Sampling substrate</b>	MEC filter and a Na <sub>2</sub> CO <sub>3</sub> impregnated back-up pad
<b>Recommended flow rate</b>	Flow rate according to manufacturer's specifications
<b>Recommended sampling time</b>	15 min – 8 h
<b>Recommended volume</b>	-

### TRANSPORT AND STORAGE

<b>Description/conditions of transport and storage incl. specific issues</b>	The sample filter is transferred to a filter transport cassette for transport to the laboratory, or it is transported in the sampler used for sampling or its internal filter cassette, after sealing with suitable plastic caps. There is a risk of sample loss from the filter if it is not handled carefully during transportation, especially for higher sample loadings.
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### ANALYSIS

<b>Sample preparation</b>	The MCE filter and the sodium carbonate-impregnated back-up pad are wet ashed with HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> and H <sub>2</sub> O <sub>2</sub> .
<b>Analytical technique</b>	After reduction of dissolution of arsenic compounds to trivalent state by H <sub>2</sub> SO <sub>4</sub> , HCl and KI, arsine is evolved from the solution by reaction with NaBH <sub>4</sub> and analysed by AAS.

### METHOD EVALUATION DATA

<b>Range studied</b>	5 – 100 µg/filter
<b>Sampling bias</b>	Overall uncertainty calculation: < 5 % (according to EN 13890) Expanded uncertainty calculation: included in sampling precision
<b>Analytical bias</b>	- 1,2 % to +0,7 %
<b>Method bias</b>	-
<b>Sampling precision</b>	Overall uncertainty calculation: < 5,3 % (according to EN 13890) Expanded uncertainty calculation: 9,0 % (incorporates bias uncertainty)

METHOD EVALUATION DATA (continued)	
Analytical precision	3,2 – 3,5 %
Method precision	-
Limit of quantification	0,05 µg
Overall uncertainty (EN 482)	19 %
Expanded uncertainty (prEN 482)	21 %
INFORMATION IN RELATION TO THE VALIDATION	
Is the sample dissolution procedure described widely applicable?	yes
Does the sample dissolution method include wall deposits, where applicable?	yes
Was a test gas atmosphere used, where applicable?	not applicable
How was the recovery determined?	From a set of spiked filters and from an interlaboratory exercise.
Was the sampler capacity or breakthrough volume determined?	no
Was temperature and RH considered, where appropriate?	not applicable
EVALUATION	
Rating category	A 1
Rationale for rating	<p>Up to date methodology, detailed method description, overall uncertainty requirements met.</p> <p>The overall uncertainty data above have been determined from the analytical bias and precision data of the method using the calculation method and sampling bias and precision estimates given in EN 13890. The expanded uncertainty data have been calculated using the method described in the EU mandated report <i>Analytical methods for chemical agents</i>. The data are for samples with an air volume of 480 l analysed by continuous flow hydride generation HGAAS.</p>
Observations	The analytical precision data reported above is from an interlaboratory exercise.
Similar methods	MDHS 41/2 , Metropol 023, BIA 6195-2, INSHT MA-035, NIOSH 7900