

## Arsenic - Total arsenic

**Function: Differential Pulse Stripping Voltammetry (DPS/a)**

**Electrode: Gold film on glassy Carbon**

Start Potential (mV)	-400
End Potential (mV)	300
Current range	102,4 $\mu$ A
Scan Speed (mV/s)	20
Deposition time (s)	180
Deposition Pot. (mV)	-600
Number of cycles	2
Delay before sweep (s)	10
Purge and stir time (s)	180
Stirring speed (rpm)	500
Drop Size (a.u.)	0
Electrode	External

### Arsenic concentrated standard solution (1 g/l)

Dissolve 1.32 g of  $As_2O_3$  in a minimum amount of 20% (p/v) KOH. Acidify to pH 3 with 20 %  $HNO_3$ . Bring to 1 l with distilled water in a volumetric flask. ( $MM_{As_2O_3} = 197.8$ ;  $MM_{As} = 74.922$ )

### Supporting electrolyte

1- 37% HCl

2- 1 g/l Au solution.

Dissolve 0.1 g of Au in a minimum volume of aqua regia (37% HCl + 65%  $HNO_3$  3+1, v/v). Moderately dry on bunsen funnel. Add 5 ml of 37% HCl to the residue. Cool and bring to volume with distilled water, in a 100 ml volumetric flask. Store in a dark bottle.

### Procedure

Pour 20 ml of sample in the cell. Add 0.5 ml of 37% HCl and 0.5 ml of gold solution.

### Working standard solution (10 mg/l)

Dilute 1+99 the concentrated standard solution with distilled water. Prepare the solution at the moment of the analysis

### Warnings

- Use this method to analyse total arsenic (As(III) + As(V)). Use indifferently As (III) or As (V) standard solution.
- At the end of each scanning eliminate the bubbles of gas ( $H_2$ ) from the surface of the electrode by a simply scrolling.
- The electrochemical cleaning of the film electrode at the end of each scanning is not necessary.
- Increase the sensitivity by increasing the deposition time. If the deposition potential is lowered above -600, a great quantity of hydrogen can grow on the surface of the electrode increasing in this way the noise of the signal and damaging the film.
- The magnetic rod has to be set very near to the electrode (about 5 mm) ensuring an efficient removal of the hydrogen.

## Analytical report

Analysis: Total arsenic in deep water

Sample Concentration = 7.80  $\mu\text{g/l}$

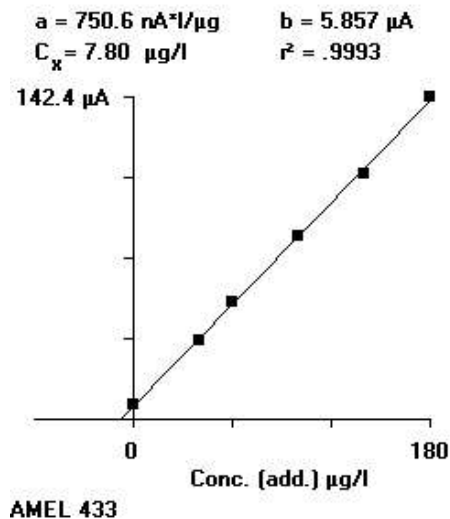
Method: 5 additions

### Volumes Table

Solvent Volume	0 (ml)
Supporting Sol.	1.04 (ml)
Sample Volume	20 (ml)
Standard Conc.	10000 ( $\mu\text{g/l}$ )

### Height Table

#	Peak Pot.	Height
0	28.9	6.239 $\mu\text{A}$
1	35	32.97 $\mu\text{A}$
2	35	48.78 $\mu\text{A}$
3	35.6	76.36 $\mu\text{A}$
4	36.4	102.2 $\mu\text{A}$
5	38.6	133.0 $\mu\text{A}$



### Regression Data

#	Add. Conc.	Height x dilution	
0	0 $\mu\text{g/l}$	6.564 $\mu\text{A}$	$y = ax + b$
1	40.0 "	34.82 $\mu\text{A}$	$a = 750.6 \text{ nA}^*/\mu\text{g}$
2	60.0 "	51.61 $\mu\text{A}$	$b = 5.857 \mu\text{A}$
3	100 "	81.10 $\mu\text{A}$	$r^2 = .9993$
4	140 "	109.0 $\mu\text{A}$	
5	180 "	142.4 $\mu\text{A}$	

