



License ID 459712  
Client ID MET0558  
User Metrohm

Program version viva 2.0 - 54  
2016-03-11 09:00:06 UTC+1

## Method parameters

Method . . . . . AB 416 Determination of As(total)  
Method saving date . . . . . 2016-03-11 08:59:57 UTC+1  
Method version . . . . . 1  
Method group . . . . . Main group  
Method status . . . . . original  
Method saved by (full name) . . . . . Metrohm International Headquarters  
Method saved by (short name) . . . . . Metrohm

## START

### Main track

#### General

Workplace view

Current view . . . . . on

Track view for live window

Live display 1 . . . . . Main track

Live display 2 . . . . . Main track

Electrode test . . . . . on

#### Application note

Measuring solution: 10 mL sample 2 mL electrolyte (c(sulfamic acid) = 1 mol/L, c(citric acid) = 0.5 mol/L, c(KCl) = 0.45 mol/L) 0.01 mL KMnO<sub>4</sub> solution (c(KMnO<sub>4</sub>) = 0.002 mol/L)

#### Sample data variables

Name	Type	Assignment	Fixed value	Comment	Monitoring
ID1	Text	ID1		Sample identification 1	off
ID2	Text	ID2		Sample identification 2	off
ID3	Text	ID3		Sample identification 3	off
Sample type	Text	Sample type		Sample type	off
Sample amount	Number	Sample amount		Sample amount	off
Sample amount unit	Text	Sample amount unit		Sample amount unit	off

Name . . . . . ID1  
Type . . . . . Text  
Assignment . . . . . on. . . . . ID1  
Fixed value . . . . . off. . . . .  
Check at start . . . . . on  
Comment . . . . . Sample identification 1

Name . . . . . ID2  
Type . . . . . Text  
Assignment . . . . . on. . . . . ID2  
Fixed value . . . . . off. . . . .



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Check at start . . . . . on  
Comment . . . . . Sample identification 2

Name . . . . . **ID3**  
Type . . . . . Text  
Assignment . . . . . on. . . . . ID3  
Fixed value . . . . . off.  
Check at start . . . . . on  
Comment . . . . . Sample identification 3

Name . . . . . **Sample type**  
Type . . . . . Text  
Assignment . . . . . on. . . . . Sample type  
Fixed value . . . . . off.  
Check at start . . . . . on  
Comment . . . . . Sample type

Name . . . . . **Sample amount unit**  
Type . . . . . Text  
Assignment . . . . . on. . . . . Sample amount unit  
Fixed value . . . . . off.  
Check at start . . . . . on  
Comment . . . . . Sample amount unit

Name . . . . . **Sample amount**  
Type . . . . . Number  
Assignment . . . . . on. . . . . Sample amount  
Fixed value . . . . . off.  
Check at start . . . . . on  
Comment . . . . . Sample amount  
Variable monitoring . . . . . off  
Lower limit . . . . .  
Upper limit . . . . .  
Message . . . . .  
Display message . . . . . on  
Record message . . . . . on  
Message by e-mail . . . . . off  
    E-mail template . . . . .  
    Subject . . . . . Message from viva - method 'New method 3' - command 'Main track'  
Acoustic signal . . . . . off  
Action . . . . . off  
Cancel determination . . . . . on  
Cancel determination and series . . . . . off

**Command comment**

AB 416/2: Method 1 - Determination of As(total) with scTRACE Gold



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**CALL Call sample**

Call text	Track name	Sample type	Condition
Call sample	Sample	off Sample	off

**CALL Call additions**

Call text	Track name	Sample type	Condition
Measure additions	Standard addition	off Sample	off

**VA TRACK VA track**

Return immediately . . . . . off

**LOOP Replications**

Stop criteria

Max. run number . . . . . on  
Max. run number . . . . . 2  
Maximum run time . . . . . off  
Signal assessment for DT . . . . . off  
Condition . . . . . off

**SQW**

**ASV**

**General/Hardware**

Device

Device name . . . . . 884\_1  
Device type . . . . . 884 Professional VA

Sensors/Electrodes

Working electrode . . . . . scTRACE Gold  
Sensor type . . . . . scTRACE Gold  
Reference electrode . . . . . Reference electrode  
Auxiliary electrode . . . . . Auxiliary electrode  
Electrode test . . . . . on

Stirrer

Stirring rate . . . . . 2000 min<sup>-1</sup>  
Hydrodynamic measurement . . . . . off

**Pretreatment**

Stirring time . . . . . 10 s

Cyclovoltammetric pretreatment

Start potential . . . . . -0.2 V  
Vertex potential . . . . . 1.0 V  
Sweep rate . . . . . 1 V/s  
Cycles . . . . . 5  
Duration . . . . . 12.00 s

Potentiostatic pretreatment

Potential 1 . . . . . -1.0 V  
Waiting time 1 . . . . . 60 s



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Potential 2 . . . . . -0.25 V  
Waiting time 2 . . . . . 5.0 s  
Potential 3 . . . . . off V  
Waiting time 3 . . . . . 0.0 s  
Potential 4 . . . . . off V  
Waiting time 4 . . . . . 0.0 s  
Potential 5 . . . . . off V  
Waiting time 5 . . . . . 0.0 s  
Equilibration time . . . . . 5.0 s

#### Sweep

Start potential . . . . . -0.3 V  
End potential . . . . . 0.4 V  
Potential step . . . . . 0.012 V  
Frequency . . . . . 100 Hz  
Potential step time . . . . . 0.010 s  
Sweep rate . . . . . 1.200 V/s  
Pulse amplitude . . . . . 0.02 V  
Sweep duration . . . . . 0.58 s

#### Post-treatment

##### Cleaning

Cleaning potential . . . . . off V  
Cleaning time . . . . . 0.0 s

##### Standby potential

Standby potential . . . . . off V

#### Potentiostat

##### Current measuring range

Highest range . . . . . 2 mA  
Lowest range . . . . . 20  $\mu$ A  
Automatically select optimum current measuring range . . . . . on

#### TRACK

##### Sample

Return immediately . . . . . off  
Delete old data . . . . . off

#### STIR & PURGE

##### Initial mixing

###### Device

Device name . . . . . 884\_1  
Device type . . . . . 884 Professional VA

###### Stir

Stirring rate . . . . . 2000 min<sup>-1</sup>  
Switch on . . . . . on  
Switch off . . . . . off  
Duration . . . . . off

###### Purge

Switch on . . . . . off  
Switch off . . . . . on



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Duration . . . . . off

**ADD SAMPLE    Add sample**

Addition

Add manually . . . . . on  
Display standard message . . . . . on  
Display message defined by the user . . . . . off  
Already added . . . . . off  
Add with dosing device . . . . . off

**ADD AUX    Add electrolyte**

Auxiliary solution

Solution . . . . . Electrolyte  
Volume . . . . . 2 mL  
Include volume in calculation . . . . . on

Addition

Add manually . . . . . on  
Display standard message . . . . . on  
Display message defined by the user . . . . . off  
Already added . . . . . off  
Add with dosing device . . . . . off

**ADD AUX    Add KMnO4**

Auxiliary solution

Solution . . . . . KMnO4 solution  
Volume . . . . . 0.01 mL  
Include volume in calculation . . . . . on

Addition

Add manually . . . . . on  
Display standard message . . . . . on  
Display message defined by the user . . . . . off  
Already added . . . . . off  
Add with dosing device . . . . . off

**CALL VA    Measure sample**

Call text . . . . . Measure sample  
Track name . . . . . VA track  
Condition . . . . . off

**TRACK    Standard addition**

Return immediately . . . . . off  
Delete old data . . . . . off

**LOOP    Variations**

Stop criteria

Max. run number . . . . . on  
Max. run number . . . . . 2  
Maximum run time . . . . . off



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Signal assessment for DT . . . . . off  
Condition . . . . . off

**STIR &  
PURGE**

**Addition mixing**

Device

Device name . . . . . 884\_1  
Device type . . . . . 884 Professional VA

Stir

Stirring rate . . . . . 2000 min<sup>-1</sup>  
Switch on . . . . . on  
Switch off . . . . . off  
Duration . . . . . off

Purge

Switch on . . . . . off  
Switch off . . . . . on  
Duration . . . . . off

**ADD STD**

**Add standard**

Standard

Solution . . . . . Standard

Addition increments

Number . . . . . 1  
Addition volume 1 . . . . . 0.05 mL

Addition

Add manually . . . . . on  
Display standard message . . . . . on  
Display message defined by the user . . . . . off  
Already added . . . . . off  
Add with dosing device . . . . . off

**CALL VA**

**Measure additions**

Call text . . . . . Measure additions  
Track name . . . . . VA track  
Condition . . . . . off

**TRACK**

**Shut off**

Return immediately . . . . . off  
Delete old data . . . . . off

**STIR &  
PURGE**

**STIR & PURGE OFF**

Device

Device name . . . . . 884\_1  
Device type . . . . . 884 Professional VA

Stir

Stirring rate . . . . . 2000 min<sup>-1</sup>  
Switch on . . . . . off  
Switch off . . . . . on  
Duration . . . . . off



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#### Purge

Switch on . . . . . off  
Switch off . . . . . on  
Duration . . . . . off

#### MAIN VALVE

##### N2 OFF

##### Device

Device name . . . . . 884\_1  
Device type . . . . . 884 Professional VA

##### Action

Open . . . . . off  
Close . . . . . on

#### EXIT

##### Exit track

#### CALL

##### Exit shut off

Call text	Track name	Sample type	Condition
Exit shut off	Shut off	off Sample	off

#### ERROR

##### Error track

#### CALL

##### Error shut off

Call text	Track name	Sample type	Condition
Exit shut off	Shut off	off Sample	off

## Evaluation parameters

### Substances

#### ASV

##### Substances - Recognition

Substance	Active	Characteristic potential	Tolerance	Min. width	Max. width	Min. measured quantity
As(total)	on	0.05 V	0.05 V	0.01 V	0.5 V	5 nA

#### ASV

##### Substances - Baseline

Substance	Baseline type	Start base point	End base point
As(total)	Linear	Automatically	Automatically

### Standards



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## Standards

Name	Standard
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As(total)	1 mg/L
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## Calibration

### General

Calibration method . . . . . Standard addition  
Blank value correction with evaluation . . . . . off  
quantity

### ASV

#### Calibration curves

Substance	Evaluation quantity	Curve type	Weighting
As(total)	Height	Linear regression	on

## Results

### Substance concentration in the sample

#### ASV

Substance	Decimal places	Assignment
As(total)	3	RS01

## Results

### Additional results

Result	Places	Prefix	Unit
Peak potential	3		V
Height	2	#	A
RSD of the heights of all replications	1		%
Area	2	#	C
RSD of the areas of all replications	1		%
Start base point	3		
End base point	3		
Standardized area	3		
Standardized height	3		
Total volume	3	#	L
Zero-order coefficient	3		
First-order coefficient	3		
Second-order coefficient	3		
Fourth-order coefficient	3		
Coefficient of determination	5		





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Result	Places	Prefix	Unit
Substance concentration in measuring vessel	2	#	
RSD of the substance concentration in measuring vessel	1		%
Amount of substance	2	#	
RSD of the substance concentration in the sample	1		%
Effective addition volume of the standard solution for the evaluation ratio	2	#	L
RSD of the effective addition volume of the standard solution for the evaluation ratio	1		%
Calibration factor DT	2	#	
RSD of the calibration factor DT	1		%
Effective addition volume of the sample solution for the evaluation ratio	2	#	L
RSD of the effective addition volume of the sample solution for the evaluation ratio	1		%

#### Database

Name database . . . . . viva