



License ID 459712  
Client ID 001-NBK-00558  
User Metrohm

Program version viva 2.0 - 54  
2018-09-27 11:47:28 UTC+2

## Method parameters

Method . . . . . AB 433 Determination of Pb  
Method saving date . . . . . 2018-09-27 11:45:22 UTC+2  
Method version . . . . . 1  
Method group . . . . . viva example methods  
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 . . . . . off

#### Application note

Measuring solution: 10 mL sample 1 mL supporting electrolyte Supporting electrolyte:  
c(citric acid) = 0.5 mol/L c(KCl) = 0.1 mol/L c(NaOH) = 0.1 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. . . . .  
Check at start . . . . . on



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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 433/1: Determination of lead at a silver film (scTRACE Gold)

#### Call sample



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## CALL

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

## CALL

### Call additions

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

##### Stirrer

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

#### Pretreatment

Stirring time . . . . . 5.0 s

##### Cyclovoltammetric pretreatment

Start potential . . . . . -1.2 V  
Vertex potential . . . . . -0.100 V  
Sweep rate . . . . . 1 V/s  
Cycles . . . . . off  
Duration . . . . . - s

##### Potentiostatic pretreatment

Potential 1 . . . . . -0.05 V  
Waiting time 1 . . . . . 5 s  
Potential 2 . . . . . -0.7 V



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Waiting time 2 . . . . . 60 s  
Potential 3 . . . . . -0.55 V  
Waiting time 3 . . . . . 5 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 . . . . . -0.7 V  
End potential . . . . . -0.3 V  
Potential step . . . . . 0.004 V  
Frequency . . . . . 150 Hz  
Potential step time . . . . . 0.007 s  
Sweep rate . . . . . 0.600 V/s  
Pulse amplitude . . . . . 0.01 V  
Sweep duration . . . . . 0.70 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 . . . . . 200  $\mu$ A  
Automatically select optimum current measuring range . . . . . on

**TRACK**

**Sample**

Return immediately . . . . . off  
Delete old data . . . . . 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 . . . . . 1 mL  
Include volume in calculation . . . . . on

**Addition**



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

**STIR &  
PURGE**

**Initial purge**

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 . . . . . off  
Duration . . . . . on  
Time . . . . . 300 s

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



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Already added . . . . . off  
Add with dosing device . . . . . off

**STIR &  
PURGE**

**Addition purge**

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 . . . . . off  
Duration . . . . . on  
Time . . . . . 30 s

**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

Purge

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

**MAIN  
VALVE**

**Main valve OFF**

Device

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

Action

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



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**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
Error 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
Pb	on	-0.48 V	0.05 V	0.05 V	0.3 V	100 nA

#### ASV

##### Substances - Baseline

Substance	Baseline type	Start base point	End base point
Pb	Linear	Automatically	Automatically

### Standards

#### Standards

Name Standard

Pb 1.0 mg/L

### Calibration

#### General

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

#### ASV

### Calibration curves

Substance	Evaluation quantity	Curve type	Weighting
Pb	Height	Linear regression	on

### Results

#### Substance concentration in the sample

##### ASV

Substance	Decimal places	Assignment
Pb	3	RS01

### Results

#### Additional results

Result	Places	Prefix	Unit
Peak potential	3		V
Height	3	μ	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		
Substance concentration in measuring vessel	2	#	
RSD of the substance concentration in measuring vessel	1		%
Amount of substance	2	μ	
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