



License ID 4570896
Client ID 001-srv-mnet06
User Metrohm

Program version viva 3.0 - 69
2025-03-14 10:38:07 UTC+1

Method parameters

Method AB 438 Determination of Cd and Pb on Bi drop
Method saving date 2025-03-14 10:29:59 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 check off

Application note

Measuring solution: 10 mL sample 1 mL supporting electrolyte

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 438/1: Determination of cadmium and lead at Bi drop

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

DP

ASV

General/Hardware

Device

Device name 884_1
Device type 884 Professional VA

Sensors/Electrodes

Working electrode RDE
Sensor type RDE/SSE
Reference electrode Reference electrode
Auxiliary electrode Auxiliary electrode
Electrode check off

Stirrer

Stirring rate 2000 min⁻¹
Hydrodynamic measurement off

Pretreatment

Stirring time 10 s

Cyclovoltammetric pretreatment

Start potential 0 V
Vertex potential -1 V
Sweep rate 1 V/s
Cycles 10
Duration 20.00 s

Potentiostatic pretreatment

Potential 1 -1.1 V
Waiting time 1 60 s
Potential 2 off V



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Waiting time 2 0.0 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 10 s

Sweep

Start potential -1 V
End potential -0.35 V
Potential step 0.006 V
Potential step time 0.1 s
Sweep rate 0.060 V/s
Pulse amplitude 0.05 V
Pulse time 0.04 s
Measuring time 0.02 s
Sweep duration 10.83 s

Post-treatment

Cleaning

Cleaning potential off V
Cleaning time 0 s

Standby potential

Standby potential off V

Potentiostat

Current measuring range

Highest range 2 mA
Lowest range 200 μ 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



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Addition

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⁻¹
Switch on on
Switch off off
Duration off

Purge

Switch on off
Switch off off
Duration on
Time 300 s

CALL COND

Conditioning in sample

Call text Conditioning in sample
Track name VA track
Stop criteria
Evaluation quantity off
Number of runs on
Number of runs 1
Action Cancel command
Run time off
Condition 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
Signal assessment for DT off



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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

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⁻¹

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⁻¹

Switch on off

Switch off on

Duration off



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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

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

General

ASV

Data processing

Smoothing 1
Reversed peaks off

Curve evaluation

Fixed point evaluation off

Substances

ASV

Substances - Recognition

Substance	Active	Characteristic potential	Tolerance	Min. width	Max. width	Min. measured quantity
Cd	on	-0.71 V	0.05 V	0.01 V	0.5 V	20 nA



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Substance	Active	Characteristic potential	Tolerance	Min. width	Max. width	Min. measured quantity
Pb	on	-0.52 V	0.05 V	0.01 V	0.5 V	20 nA

ASV

Substances - Baseline

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

Standards

Standards

Name	Standard
------	----------

Cd	1.0 mg/L
----	----------

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
Cd	Height	Linear regression	on
Pb	Height	Linear regression	on

Results

Substance concentration in the sample

ASV

Substance	Decimal places	Assignment
Cd	2	RS01
Pb	2	RS02

Results

Additional results



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Result	Places	Prefix	Unit
Peak potential	3		V
Height	3	μ	A
RSD of the heights of all replications	1		%
Measured value	2	#	A
RSD of the measured values 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		
Standardized measured value	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