



License ID 1955606
Client ID 001-NBK-02361
User Metrohm

Program version viva 3.0 - 69
2024-03-21 15:22:37 UTC+1

Method parameters

Method AB401 Leveler (CVS, RC) semiauto - with
dilution
Method saving date 2024-03-21 15:12:29 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 on

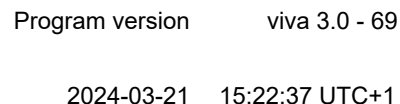
Application note

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



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 'Leveler determination (CVS, RC), semiautomated1' - command 'Main track'
Acoustic signal	off
Action	off
Cancel determination	on
Cancel determination and series	off

AB-401/3: Determination of leveler by CVS-RC semiautomated - with dilution

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CALL

Call text	Track name	Sample type	Condition
Add VMS	Electrolyte VMS	off Sample	off
Add suppressor	Electrolyte suppressor	off Sample	off
Add brightener	Electrolyte brightener	off Sample	off

CALL COND

Conditioning electrolyte

Call text Conditioning electrolyte
Track name VA track
Stop criteria
Evaluation quantity on
Voltammetry command CVS
Substance Leveler
Standard deviation 2 %
Number of runs on
Number of runs 20
Action Cancel command
Run time off
Condition off

CALL ELECTROL YTE

Measure electrolyte

Call text Measure electrolyte
Track name VA track
Condition off

CALL

Sample or standard?

Call text	Track name	Sample type	Condition
RC Determination	RC Determination	on Sample	off
RC Calibration	RC Calibration	on Standard	off

VA TRACK VA track

Return immediately off

CVS

CVS

General/Hardware

Device

Device name 894_1
Device type 894 Professional CVS

Sensors/Electrodes

Working electrode RDE
Sensor type RDE/SSE
Reference electrode Reference electrode
Auxiliary electrode Auxiliary electrode



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Electrode check on

Stirrer

Stirring rate 2500 min⁻¹

Hydrodynamic measurement on

Pretreatment

Stirring time 5.0 s

Cyclovoltammetric pretreatment

Start potential 0.2 V

Vertex potential 1.625 V

Sweep rate 1 V/s

Cycles off

Duration - s

Potentiostatic pretreatment

Potential 1 off V

Waiting time 1 0.0 s

Potential 2 off V

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 5.0 s

Sweep

Start potential 1.625 V

1st vertex potential -0.175 V

2nd vertex potential 1.625 V

Potential step 0.006 V

Potential step time 0.060 s

Sweep rate 0.100 V/s

Preparation cycles 1

Measuring cycles 2

Sweep duration 109.08 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 224 mA

Lowest range 20 µA

RC Determination



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TRACK 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

CALL **Add electrolyte sample**

Call text	Track name	Sample type		Condition
Sample suppressor	Sample suppressor	off	Sample	off
Sample brightener	Sample brightener	off	Sample	off

CALL VA **Measure sample**

Call text Measure sample

Track name VA track

Condition off

TRACK **RC Calibration**

Return immediately off

Delete old data off

LOOP **Variations**

Stop criteria

Max. run number on

Max. run number 5

Maximum run time off

Signal assessment for DT off

Condition off

ADD STD **ADD STD**

Standard

Solution Standard or sample

Addition increments

Number 1

Addition volume 1 0.05 mL

Addition

Add manually off

Already added off

Add with dosing device on

Dosing rate 2.0 mL/min



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Filling rate maximum mL/min

CALL VA Measure standard

Call text Measure standard
Track name VA track
Condition off

TRACK Electrolyte VMS

Return immediately off
Delete old data off

ADD AUX ADD VMS

Auxiliary solution

Solution VMS
Volume 23.5 mL
Include volume in calculation on

Addition

Add manually off
Already added off
Add with dosing device on
Dosing rate maximum mL/min
Filling rate maximum mL/min

TRACK Electrolyte suppressor

Return immediately off
Delete old data off

ADD AUX ADD Suppressor

Auxiliary solution

Solution Suppressor concentrate
Volume 0.5 mL
Include volume in calculation on

Addition

Add manually off
Already added off
Add with dosing device on
Dosing rate 2.0 mL/min
Filling rate maximum mL/min

TRACK Electrolyte brightener

Return immediately off
Delete old data off

ADD AUX ADD Brightener

Auxiliary solution

Solution Brightener concentrate
Volume 1 mL
Include volume in calculation on

Addition



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Add manually off
Already added off
Add with dosing device on
Dosing rate 2.0 mL/min
Filling rate maximum mL/min

TRACK Sample suppressor

Return immediately off
Delete old data off

ADD AUX Add suppressor sample

Auxiliary solution

Solution Suppressor concentrate
Volume 0.25 mL
Include volume in calculation on

Addition

Add manually off
Already added off
Add with dosing device on
Dosing rate 2.0 mL/min
Filling rate maximum mL/min

TRACK Sample brightener

Return immediately off
Delete old data off

ADD AUX Add brightener sample

Auxiliary solution

Solution Brightener concentrate
Volume 0.5 mL
Include volume in calculation on

Addition

Add manually off
Already added off
Add with dosing device on
Dosing rate 2.0 mL/min
Filling rate maximum mL/min

TRACK Fill DU VMS

Return immediately off
Delete old data off

LQH DU 50 mL VMS

General/Hardware

Dosing device

Dosing unit 50 mL VMS

Parameters

Function Fill



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Port 2
Rate maximum mL/min

TRACK Fill DU Brightener
Return immediately off
Delete old data off

LQH DU 2 mL Brightener
General/Hardware
Dosing device
Dosing unit 2 mL Brightener
Parameters
Function Fill
Port 2
Rate maximum mL/min

TRACK Fill DU Suppressor
Return immediately off
Delete old data off

LQH DU 2 mL Suppressor
General/Hardware
Dosing device
Dosing unit 2 mL Suppressor
Parameters
Function Fill
Port 2
Rate maximum mL/min

TRACK Fill DU Leveler
Return immediately off
Delete old data off

LQH DU 2 mL Std or sample
General/Hardware
Dosing device
Dosing unit 2 mL Standard or sample
Parameters
Function Fill
Port 2
Rate maximum mL/min

TRACK Shut OFF
Return immediately off
Delete old data off

STIR Stirrer OFF
Device
Device name 894_1



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Device type 894 Professional CVS
Stirrer
Stirring rate 2500 min⁻¹
Action
Switch on off
Switch off on
Duration off
Time 300 s

EXIT Exit track

CALL Exit shut off

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

CALL Fill Dosing Units

Call text	Track name	Sample type		Condition
Fill DU VMS	Fill DU VMS	off	Sample	off
Fill DU Brightener	Fill DU Brightener	off	Sample	off
Fill DU Suppressor	Fill DU Suppressor	off	Sample	off
Fill DU Leveler	Fill DU Leveler	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

CVS

Data processing

Smoothing 1
Reversed peaks off

Curve evaluation

Fixed point evaluation off

Substances

CVS



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Substances - Recognition

Substance	Active	Characteristic potential	Tolerance	Min. width	Max. width	Min. measured quantity	Sweep direction
Leveler	on	0.3 V	0.2 V	0.01 V	1 V	200 pA	anodic

CVS

Substances - Baseline

Substance	Baseline type	Start base point	End base point
Leveler	Horizontal	0.8 V	-0.05 V

Standards

Standards

Name Standard or sample

Leveler 1000 mL/L

Calibration

General

Calibration method RC
Blank value correction with evaluation off
quantity

CVS

Calibration curves

Substance	Evaluation quantity	Curve type for standard	Weighting
Leveler	Area	Linear interpolation	on

Begin of evaluation
standard

1.1

Results

Substance concentration in the sample

CVS

Substance	Decimal places	Assignment
Leveler	2	RS01

Results

Additional results



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Result	Places	Prefix	Unit
Peak potential	3		V
Height	2	#	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	#	
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