



License ID 1874704
Client ID 001-nbk-03142
User Metrohm

Program version viva 4.0 - 78
2026-09-21 11:33:17 UTC+2

Method parameters

Method MVA-20 – Leveler determination - method 2
Method saving date 2026-09-21 11:29:51 UTC+2
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

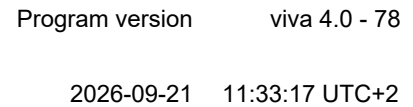
Application note

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 position	Number	Sample position		Sample position number	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.



Name	Sample amount
Type	Number

800105022: MVA-20 - Determination of leveler by CVS-RC with sample dilution

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 electrolyte



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TRACK Return immediately off

Delete old data off

CALL Empty measuring vessel

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

CALL Add electrolyte

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

TRACK RC Determination

Return immediately off
Delete old data off

CALL Call electrolyte sample

Call text	Track name	Sample type		Condition
RC electrolyte	RC electrolyte	off	Sample	off

Sample addition



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CALL

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

CALL

Additional additives

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

CALL VA

Measure sample

Call text Measure sample
Track name VA track
Condition off

CALL

CALL Rinse needle

Call text	Track name	Sample type		Condition
Rinse needle	Rinse Needle	off	Sample	off

TRACK

RC Calibration

Return immediately off
Delete old data off

CALL

CALL PREP Standard

Call text	Track name	Sample type		Condition
CALL PREP Standard	PREP Standard	on	Standard	off

CALL

Call electrolyte standard

Call text	Track name	Sample type		Condition
RC electrolyte	RC electrolyte	off	Sample	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



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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
Filling rate maximum mL/min

CALL VA Measure standard

Call text Measure standard
Track name VA track
Condition off

CALL Clean DU standard

Call text	Track name	Sample type		Condition
Clean DU standard	Rinse DU standard	off	Standard	off

TRACK PREP Standard

Return immediately off
Delete old data off

CALL Empty vessel standard

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

CALL Move to standard

Call text	Track name	Sample type		Condition
Move to standard	Next sample	off	Sample	off

LOOP LOOP PREP Standard

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

PREP with standard



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PREP Dosing device

Dosing unit 2 mL Standard or sample

CALL Rinsing PREP standard

Call text	Track name	Sample type	Condition
Rinsing cycle	Rinsing cycle	off Sample	off

TRACK Add sample automatically

Return immediately off
Delete old data off

CALL CALL Next sample

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

CALL Transfer sample

Call text	Track name	Sample type	Condition
Peristaltic pump ON	Peristaltic pump	off Sample	off

ADD SAMPLE ADD SAMPLE

Addition
Add manually off
Already added on
Add with dosing device off

TRACK Next sample

Return immediately off
Delete old data off

MOVE MOVE to sample position

Device
Device name 919 IC Autosampler plus 1
Device type 919.0020 IC Autosampler plus
Target
Tower 1
Move Sample position
Beaker test
Display message on
Cancel determination off
Cancel determination and series off
Parameters
Shift rate 20 °/s
Shift direction auto



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Swing rate 55 °/s

LIFT Needle → Work position

Device

Device name 919 IC Autosampler plus 1

Device type 919.0020 IC Autosampler plus

Target

Tower 1

Lift position Work position mm

Parameters

Lift rate 25 mm/s

TRACK Peristaltic pump

Return immediately off

Delete old data off

PUMP Peristaltic pump ON

Device

Device name 919 IC Autosampler plus 1

Device type 919.0020 IC Autosampler plus

Pumps

Tower 1

Pump(s) Peristaltic

Rate 10

Action

Switch on off

Switch off off

Duration on

Time 300 s

TRACK Rinse Needle

Return immediately off

Delete old data off

CALL Empty vessel rinse needle

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

CALL Rinsing position needle

Call text	Track name	Sample type	Condition
Rinsing position	Rinsing position	off Sample	off

CALL Transfer rinsing solution



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Call text	Track name	Sample type	Condition
Peristaltic pump ON	Peristaltic pump	off Sample	off

TRACK**Rinsing position**

Return immediately off
Delete old data off

MOVE**Go to rinsing position**

Device

Device name 919 IC Autosampler plus 1
Device type 919.0020 IC Autosampler plus

Target

Tower 1
Move Rack position
Number = 'SD.Sample position' + 14

Beaker test

Display message on
Cancel determination off
Cancel determination and series off

Parameters

Shift rate 20 %/s
Shift direction auto
Swing rate 55 %/s

LIFT**Needle → Rinsing solution**

Device

Device name 919 IC Autosampler plus 1
Device type 919.0020 IC Autosampler plus

Target

Tower 1
Lift position Work position mm

Parameters

Lift rate 25 mm/s

TRACK**Rinse DU standard**

Return immediately off
Delete old data off

CALL**Empty vessel rinsing DU**

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

CALL**Rinsing position DU**



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Call text	Track name	Sample type	Condition
Rinsing position	Rinsing position	off Sample	off

PREP

PREP rinsing solution

Dosing device

Dosing unit 2 mL Standard or sample

LIFT

Needle → Shift DU

Device

Device name 919 IC Autosampler plus 1

Device type 919.0020 IC Autosampler plus

Target

Tower 1

Lift position Shift position mm

Parameters

Lift rate 25 mm/s

PUMP

Empty needle

Device

Device name 919 IC Autosampler plus 1

Device type 919.0020 IC Autosampler plus

Pumps

Tower 1

Pump(s) Peristaltic

Rate 10

Action

Switch on off

Switch off off

Duration on

Time 30 s

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



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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

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



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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	Rinsing cycle Return immediately off Delete old data off								
STIR	Stir rinsing ON Device Device name 894_1 Device type 894 Professional CVS Stirrer Stirring rate 2500 min ⁻¹ Action Switch on on Switch off off Duration off								
LOOP	LOOP Rinsing Stop criteria Max. run number on Max. run number 2 Maximum run time off Signal assessment for DT off Condition off								
CALL	CALL Drain <table><tr><td>Call text</td><td>Track name</td><td>Sample type</td><td>Condition</td></tr><tr><td>Drain</td><td>Drain</td><td>off Sample</td><td>off</td></tr></table>	Call text	Track name	Sample type	Condition	Drain	Drain	off Sample	off
Call text	Track name	Sample type	Condition						
Drain	Drain	off Sample	off						
CALL	CALL Rinse								



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

TRACK**Rinse**

Return immediately off
Delete old data off

PUMP**PUMP Rinse**

Device

Device name 919 IC Autosampler plus 1
Device type 919.0020 IC Autosampler plus

Pumps

Tower 1
Pump(s) 2

Action

Switch on off
Switch off off
Duration on
Time 9 s

TRACK**Drain**

Return immediately off
Delete old data off

PUMP**PUMP Drain**

Device

Device name 919 IC Autosampler plus 1
Device type 919.0020 IC Autosampler plus

Pumps

Tower 1
Pump(s) 1

Action

Switch on off
Switch off off
Duration on
Time 50 s

TRACK**Fill DU VMS**

Return immediately off
Delete old data off

LQH**FILL 50 mL VMS****General/Hardware**

Dosing device

Dosing unit 50 mL VMS

Parameters



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Function Fill
Port 2
Rate maximum mL/min

TRACK Fill DU Brightener

Return immediately off
Delete old data off

**LQH FILL 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 FILL 2 mL Suppressor
General/Hardware**

Dosing device
Dosing unit 2 mL Suppressor

Parameters

Function Fill
Port 2
Rate maximum mL/min

TRACK Fill DU Standard

Return immediately off
Delete old data off

**LQH 2 mL Standard or sample
General/Hardware**

Dosing device
Dosing unit 2 mL Standard or sample

Parameters

Function Fill
Port 2
Rate 2 mL/min

TRACK Shut off

Return immediately off
Delete old data off

PUMP Rinse Drain pumps OFF

Device



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Device name 919 IC Autosampler plus 1
Device type 919.0020 IC Autosampler plus
Pumps
Tower 1
Pump(s) 1+2
Action
Switch on off
Switch off on
Duration off
Time 8.0 s

PUMP Peristaltic pump OFF

Device
Device name 919 IC Autosampler plus 1
Device type 919.0020 IC Autosampler plus
Pumps
Tower 1
Pump(s) Peristaltic
Rate 10
Action
Switch on off
Switch off on
Duration off
Time 300.0 s

STIR Stirrer OFF

Device
Device name 894_1
Device type 894 Professional CVS
Stirrer
Stirring rate 2500 min⁻¹
Action
Switch on off
Switch off on
Duration off
Time 300 s

LIFT Needle → Shift position

Device
Device name 919 IC Autosampler plus 1
Device type 919.0020 IC Autosampler plus
Target
Tower 1
Lift position Shift position mm
Parameters
Lift rate 25 mm/s



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**SERIES
START** **Series start track**

RACK **Rack init**

Device

Device name 919 IC Autosampler plus 1

Device type 919.0020 IC Autosampler plus

Rack test on

Test rack 6.2041.490

MOVE **Move to Pos 1**

Device

Device name 919 IC Autosampler plus 1

Device type 919.0020 IC Autosampler plus

Target

Tower 1

Move Rack position

Number 1

Beaker test

Display message on

Cancel determination off

Cancel determination and series off

Parameters

Shift rate 20 %/s

Shift direction auto

Swing rate 55 %/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 Standard or sample	Fill DU Standard	off	Sample	off

ERROR **Error track**



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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

Substances - Recognition

Substance	Active	Characteristic potential	Tolerance	Min. width	Max. width	Min. measured quantity	Sweep direction
Leveler	on	0.1 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

Measurement of the electrolyte value

In the same determination as sample/standard on

In a separate determination off

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

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		
Normalized area	3		
Normalized height	3		
Normalized 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



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Result	Places	Prefix	Unit
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