



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

Program version viva 4.0 - 78
2026-09-21 13:46:52 UTC+2

Method parameters

Method MVA-23 – Brightener determination
Method saving date 2026-09-21 13:14:42 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.



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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 position**
Type Number
Assignment on. Sample position
Fixed value off.
Check at start on
Comment Sample position number
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 4' - command 'Main track'
Acoustic signal off
Action off
Cancel determination on
Cancel determination and series off

Name **Sample amount**
Type Number



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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 4' - command 'Main track'
Acoustic signal off
Action off
Cancel determination on
Cancel determination and series off

Command comment

800105023: MVA-23 - Determination of brightener by CVS-MLAT

CALL Empty measuring vessel

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

CALL Call intercept

Call text	Track name	Sample type	Condition
Measure intercept	Intercept	off Sample	off

CALL Call sample

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

CALL Call additions

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

CALL Call rinse needle



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Call text	Track name	Sample type	Condition
Rinse needle	Go to rinsing position	off Sample	off

CALL

Call final rinsing

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

VA TRACK VA track

Return immediately off

CVS

CVS

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 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



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Equilibration time 5.0 s

Sweep

Start potential 1.625 V
1st vertex potential -0.300 V
2nd vertex potential 1.625 V
Potential step 0.006 V
Potential step time 0.040 s
Sweep rate 0.15 V/s
Preparation cycles 1
Measuring cycles 2
Sweep duration 77.76 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

TRACK

Intercept

Return immediately off
Delete old data off

CALL

Add intercept solution

Call text	Track name	Sample type		Condition
Add VMS	Intercept VMS	off	Sample	off
Add suppressor	Intercept suppressor	off	Sample	off

**CALL
COND**

Conditioning intercept

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



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CALL INTERCEPT **Measure intercept**
Call text Measure intercept
Track name VA track
Condition off

TRACK **Sample**
Return immediately off
Delete old data off

CALL **Sample addition**

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

ADD AUX **Add additional suppressor**
Auxiliary solution
Solution Suppressor concentrate
Volume 0.2 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

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 Brightener concentrate
Addition increments



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Number 1
Addition volume 1 0.015 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 additions

Call text Measure additions
Track name VA track
Condition 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 858 Professional Sample Processor 1
Device type 858.0020 Professional Sample Processor
Target
Tower 1
Move Sample position
Beaker test
Display message on



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Cancel determination off
Cancel determination and series off

Parameters

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

LIFT

Needle → Work position

Device

Device name 858 Professional Sample Processor 1
Device type 858.0020 Professional Sample Processor

Target

Tower 1
Lift position Work position mm

Parameters

Lift rate 25 mm/s

TRACK

Go to rinsing position

Return immediately off
Delete old data off

CALL

Empty vessel

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

MOVE

Move to rinsing position

Device

Device name 858 Professional Sample Processor 1
Device type 858.0020 Professional Sample Processor

Target

Tower 1
Move Rack position
Number = 'SD.Sample position' + 28

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 to Work position

Device

Device name 858 Professional Sample Processor 1
Device type 858.0020 Professional Sample Processor



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Target

Tower 1
Lift position Work position mm

Parameters

Lift rate 25 mm/s

CALL Transfer rinsing solution

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

TRACK Intercept VMS

Return immediately off
Delete old data off

ADD AUX Add VMS intercept

Auxiliary solution

Solution VMS
Volume 30 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 Intercept suppressor

Return immediately off
Delete old data off

ADD AUX Add suppressor intercept

Auxiliary solution

Solution Suppressor concentrate
Volume 1.2 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 Peristaltic pump

Return immediately off
Delete old data off

Peristaltic pump ON



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PUMP

Device

Device name 858 Professional Sample Processor 1
Device type 858.0020 Professional Sample Processor

Pumps

Tower 1
Pump(s) Peristaltic
Rate 10

Action

Switch on off
Switch off off
Duration on
Time 300.0 s

TRACK

Rinsing cycle

Return immediately off
Delete old data off

STIR

Stirrer ON

Device

Device name 884_1
Device type 884 Professional VA

Stirrer

Stirring rate 2500 min⁻¹

Action

Switch on on
Switch off off
Duration off
Time 300 s

LOOP

Rinsing cycles

Stop criteria

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

CALL

CALL Drain

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

STIR

Stirrer rinsing OFF

Device

Device name 884_1

Device type 884 Professional VA

Stirrer

Stirring rate 2500 min⁻¹

Action

Switch on off

Switch off on

Duration off

Time 300 s

TRACK

Rinse

Return immediately off

Delete old data off

PUMP

Pump Rinse

Device

Device name 858 Professional Sample Processor 1

Device type 858.0020 Professional Sample Processor

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 858 Professional Sample Processor 1

Device type 858.0020 Professional Sample Processor

Pumps

Tower 1

Pump(s) 1

Action

Switch on off

Switch off off



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Duration on
Time 50 s

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
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 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 Shut off
Return immediately off
Delete old data off

PUMP Rinse Drain pumps OFF
Device
Device name 858 Professional Sample Processor 1



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Device type 858.0020 Professional Sample Processor
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 858 Professional Sample Processor 1
Device type 858.0020 Professional Sample Processor
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 884_1
Device type 884 Professional VA
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 858 Professional Sample Processor 1
Device type 858.0020 Professional Sample Processor
Target
Tower 1
Lift position Shift position mm
Parameters
Lift rate 25 mm/s

Series start track



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SERIES START

RACK

Rack init

Device

Device name 858 Professional Sample Processor 1

Device type 858.0020 Professional Sample Processor

Rack test on

Test rack 6.2041.450

MOVE

Move to Pos 1

Device

Device name 858 Professional Sample Processor 1

Device type 858.0020 Professional Sample Processor

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 suppressor	Fill DU suppressor	off Sample	off
Fill DU brightener	Fill DU brightener	off Sample	off

ERROR

Error track

CALL

Error shut off



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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
Brightener	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
Brightener	Horizontal	0.3 V	-0.05 V

Standards

Standards

Name Brightener concentrate

Brightener 1000 mL/L

Calibration

General

Calibration method MLAT

CVS

Calibration curves

Substance	Evaluation quantity	Curve type	Weighting
Brightener	Area	Linear regression	on



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Results

Substance concentration in the sample

CVS

Substance	Decimal places	Assignment
Brightener	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
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