



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

Method parameters

Method AB444 – MVA-24 - Suppressor (CVS, DT)
Method saving date 2024-02-23 13:35:33 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

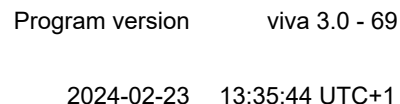
In the field Prep cycles enter the number of preparation cycles to prepare the Dosing
Unit «5 mL Standard or sample» with solution from the rack.

Sample data variables

Name	Type	Assignment	Fixed value	Comment	Monitoring
ID1	Text	ID1		Sample identification 1	off
ID2	Text	ID2		Sample identification 2	off
Prep cycles	Number	ID3		Number of preparation	off
Sample type	Text	Sample type		Sample type	off
Sample position	Number	Sample position		Sample position number	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
Comment Sample identification 2





License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

Action off
Cancel determination on
Cancel determination and series off

Command comment

AB-444/1: MVA-24 - Determination of suppressor by CVS, DT

CALL Prep standard or sample

Call text	Track name	Sample type	Condition
Prepare standard or sample	Sample from rackoff	Sample	off

CALL Run VMS

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

CALL Sample or standard?

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

CALL Final rinsing

Call text	Track name	Sample type	Condition
Final rinsing	Rinsing	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



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

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 μ A

TRACK

VMS

Return immediately off

Delete old data off

Empty measuring vessel



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

CALL

Call text	Track name	Sample type	Condition
Empty measuring vessel	Drain	off Sample	off

CALL

Add VMS

Call text	Track name	Sample type	Condition
Dose VMS	Dose VMS	off Sample	off

CALL COND

Conditioning in VMS

Call text Conditioning in VMS
Track name VA track
Stop criteria
Evaluation quantity on
Voltammetry command CVS
Substance Suppressor
Standard deviation 0.5 %
Number of runs on
Number of runs 10
Action Cancel command
Run time off
Condition off

CALL VMS

Measure VMS

Call text Measure VMS
Track name VA track
Condition off

TRACK

DT Determination

Return immediately off
Delete old data off

LOOP

Sample addition

Stop criteria
Max. run number off
Maximum run time off
Signal assessment for DT on
Voltammetry command CVS
Substance Suppressor
Signal ratio Q/Q(0) 0.45
Condition off

ADD SAMPLE DT

Add sample DT

Addition increments
Number 1
Addition volume 1 0.010 mL



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

Addition

Add manually off
Add with dosing device on
Dosing unit 5 mL Standard or sample
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 DT Calibration

Return immediately off
Delete old data off

LOOP Standard addition

Stop criteria
Max. run number off
Maximum run time off
Signal assessment for DT on
Voltammetry command CVS
Substance Suppressor
Signal ratio Q/Q(0) 0.45
Condition off

ADD STD Add standard DT

Standard
Solution Sample or standard
Addition increments
Number 1
Addition volume 1 0.010 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

TRACK Sample from rack

Return immediately off
Delete old data off

Empty meas_vessel start



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

CALL

Call text	Track name	Sample type	Condition
Empty measuring vessel	Drain	off Sample	off

MOVE

Move to sample position

Device

Device name 858 Sample Processor
Device type 858.0010 Professional Sample Processor

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
Swing rate 55 %/s

LIFT

Needle → Work position

Device

Device name 858 Sample Processor
Device type 858.0010 Professional Sample Processor

Target

Tower 1
Lift position Work position mm

Parameters

Lift rate 25 mm/s

CALL

Prepare DU

Call text	Track name	Sample type	Condition
Prepare 5mL DU	Prepare 5mL DU off	Sample	off

TRACK

Prepare 5mL DU

Return immediately off
Delete old data off

LOOP

No of preparation cycles

Stop criteria

Max. run number on
Max. run number = Case('Prep standard or sample.BSY' = 1
AND 'SD.Prep cycles' >= 1 ; 'SD.Prep
cycles' ; 1 ; 1)
Maximum run time off



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

Signal assessment for DT off
Condition off

PREP 5 mL Standard or sample

Dosing device

Dosing unit 5 mL Standard or sample

PUMP Draining ON

Device

Device name 858 Sample Processor

Device type 858.0010 Professional Sample Processor

Pumps

Tower 1

Pump(s) 1

Action

Switch on off

Switch off off

Duration on

Time 5 s

CALL Rinse measuring vessel

Call text	Track name	Sample type	Condition
Rinse	Rinse	off Sample	off = 'No of preparation cycles.LCO' > 0

CALL Rinsing after DU prep

Call text	Track name	Sample type	Condition
Rinsing after DU prep	Rinsing	off Sample	off = 'No of preparation cycles.LCO' > 0

TRACK Rinse DU

Return immediately off

Delete old data off

CALL Empty vessel

Call text	Track name	Sample type	Condition
Empty measuring vessel	Drain	off Sample	off

MOVE Move to rinsing vial 28

Device

Device name 858 Sample Processor

Device type 858.0010 Professional Sample Processor



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

Target

Tower 1
Move Rack position
Number 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

Lift → Work position

Device

Device name 858 Sample Processor
Device type 858.0010 Professional Sample Processor

Target

Tower 1
Lift position Work position mm

Parameters

Lift rate 25 mm/s

CALL

Prepare with H2O

Call text	Track name	Sample type	Condition
Prepare 5mL DU	Prepare 5mL DU off	Sample	off

TRACK

Dose VMS

Return immediately off
Delete old data off

ADD AUX

Add VMS 1

Auxiliary solution

Solution VMS 1
Volume 50 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

Rinsing

Return immediately off
Delete old data off



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

LOOP

Rinsing cycles

Stop criteria

Max. run number on
Max. run number 1
Maximum run time off
Signal assessment for DT off
Condition 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

CALL

CALL Drain

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

CALL

CALL Rinse

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

TRACK

Rinse

Return immediately off
Delete old data off

PUMP

Rinsing time

Device

Device name 858 Sample Processor
Device type 858.0010 Professional Sample Processor

Pumps

Tower 1
Pump(s) 2

Action

Switch on off
Switch off off
Duration on
Time 18 s



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

TRACK	Drain	
	Return immediately	off
	Delete old data	off
PUMP	Draining time	
	Device	
	Device name	858 Sample Processor
	Device type	858.0010 Professional Sample Processor
	Pumps	
	Tower	1
	Pump(s)	1
	Action	
	Switch on	off
	Switch off	off
	Duration	on
	Time	50 s
TRACK	DU VMS	
	Return immediately	off
	Delete old data	off
LQH	Fill 50 mL VMS 1	
	General/Hardware	
	Dosing device	
	Dosing unit	50 mL VMS 1
	Parameters	
	Function	Fill
	Port	2
	Rate	maximum mL/min
	DU Standard or sample	
	Return immediately	off
	Delete old data	off
LQH	Fill 5 mL Standard/Sample	
	General/Hardware	
	Dosing device	
	Dosing unit	5 mL Standard or sample
	Parameters	
	Function	Fill
	Port	2
	Rate	maximum mL/min
	Shut OFF	
	Return immediately	off
	Delete old data	off
PUMP	Rinse Drain pumps OFF	
	Device	



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

Device name 858 Sample Processor
Device type 858.0010 Professional Sample Processor
Pumps
Tower 1
Pump(s) 1+2
Action
Switch on off
Switch off on
Duration off
Time 8.0 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

CALL

Condition shift needle

Call text	Track name	Sample type	Condition
Condition shift needle	Shift needle	off Sample	on = 'SD.Sample position' <> 'SD.NEXT.Sample position'

TRACK

Shift needle

Return immediately off
Delete old data off

LIFT

Needle → Shift position

Device
Device name 858 Sample Processor
Device type 858.0010 Professional Sample Processor
Target
Tower 1
Lift position Shift position mm
Parameters
Lift rate 25 mm/s

**SERIES
START**

Series start track



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69

2024-02-23 13:35:44 UTC+1

RACK RACK INIT
Device
Device name 858 Sample Processor
Device type 858.0010 Professional Sample Processor
Rack test on
Test rack 6.2041.450

**SERIES
END Series end track**

CALL Rinse DU 5 mL Standard/Sa

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

CALL Series end shut OFF

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

CALL Series end shift needle

Call text	Track name	Sample type	Condition
Shift needle	Shift needle	off Sample	off

EXIT Exit track

CALL Fill Dosing Units

Call text	Track name	Sample type	Condition
Fill DU Standard or sample	DU Standard or sample	off Sample	off
Fill DU VMS	DU VMS	off Sample	off

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



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

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
Suppressor	on	0.2 V	0.2 V	0.01 V	1 V	200 pA	anodic

CVS

Substances - Baseline

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

Standards

Standards

Name	Sample or standard
------	--------------------

Suppressor	10 mL/L
------------	---------

Calibration

General

Calibration method DT
Blank value correction with evaluation quantity off

CVS

Calibration curves



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

Substance	Evaluation quantity	Curve type for standard	Weighting
Suppressor	Area	Nonlinear regression	on
Begin of evaluation standard	Curve type for sample	Begin of evaluation sample	Evaluation ratio
1.10	Nonlinear regression	1.10	0.5

Results

Substance concentration in the sample

CVS

Substance	Decimal places	Assignment
Suppressor	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		
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



License ID 1955606
Client ID 001-NBK-02363
User Metrohm

Program version viva 3.0 - 69
2024-02-23 13:35:44 UTC+1

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