



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

Program version viva 3.0 - 69
2024-02-23 13:27:27 UTC+1

Method parameters

Method AB444 – MVA-24 - Conditioning in VMS
Method saving date 2024-02-23 13:27:19 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

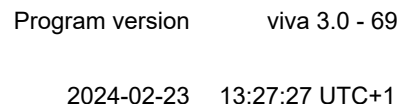
Application note

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	Sample type	off
Sample amount	Number	Sample amount	30	Sample amount	off
Sample amount unit	Text	Sample amount unit	mL	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
Comment Sample identification 2



AB-444/1: MVA-24 - Conditioning of electrodes in VMS

Empty measuring vessel



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

**ADD
SAMPLE**

Add VMS 1

Addition

Add manually off
Already added off
Add with dosing device on
Dosing unit 50 mL VMS 1
Dosing rate maximum mL/min
Filling rate maximum mL/min

**CALL
COND**

Conditioning in Cu VMS

Call text Conditioning in Cu VMS
Track name VA track
Stop criteria
Evaluation quantity on
Voltammetry command CVS
Substance Cu
Standard deviation 0.5 %
Number of runs on
Number of runs 20
Action Cancel command
Run time off
Condition off

CALL VA

Measure VMS

Call text Measure VMS
Track name VA track
Condition 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



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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
Equilibration time 5.0 s
Sweep
Start potential 1.625 V
1st vertex potential -0.250 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 113.76 s
Post-treatment
Cleaning
Cleaning potential off V
Cleaning time 0.0 s
Standby potential
Standby potential off V
Potentiostat
Current measuring range



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Highest range 224 mA
Lowest range 20 µA

TRACK Rinsing
Return immediately off
Delete old data off

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



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Pump(s) 2
Action
Switch on off
Switch off off
Duration on
Time 18 s

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

TRACK Shut OFF
Return immediately off
Delete old data off

PUMP Pumps OFF
Device
Device name 858 Sample Processor
Device type 858.0010 Professional Sample Processor
Pumps
Tower 1
Pump(s) 1+2



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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

SERIES START

Series start track

RACK

RACK INIT

Device

Device name 858 Sample Processor
Device type 858.0010 Professional Sample Processor

Rack test off

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

Target

Tower 1
Move Rack position
Number 28

Beaker test

Display message on
Cancel determination off



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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

Prepare 5mL DU

Return immediately off
Delete old data off

LOOP

No of preparation cycles

Stop criteria

Max. run number on
Max. run number 1
Maximum run time off
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



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Duration on
Time 5 s

CALL Rinse measuring vessel

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

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

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

EXIT Exitspur

CALL Fill Dosing Unit



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	Call text	Track name	Sample type	Condition
	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			
	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 on

Fixed points

Fixed point	Measured quantity	Fixed value	Sweep direction
1	Potential	1.125 V	anodic
2	Potential	1.475 V	anodic

Substances

CVS

Substances - Recognition

Substance	Active	Characteristic potential	Tolerance	Min. width	Max. width	Min. measured quantity	Sweep direction
Cu	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
Cu	Horizontal	0.8 V	-0.05 V



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CVS

Calibration curves

Results

Substance concentration in the sample

CVS

Substance	Decimal places	Assignment
Cu	2	none

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
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		%

User-defined results



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Result type	Result name	Formula	Unit	Decimal places	Assignment	Description
Single result	Conditioned area	= 'RS.CVS.Cu.VAR {1}.AREA.MNV' *1000	mC	2	RS01	Conditioned area
Single result	Contamination current	= 'RS.CVS.VAR{1}.FP{1}.CUR.MNV' * 1000000	µA	2	RS02	Contamination current
Single result	Chloride current	= 'RS.CVS.VAR{1}.FP{2}.CUR.MNV' * 1000000	µA	2	RS03	Chloride current

Database

Name database viva