



License ID 459712
Client ID 001-nbk-00348
User Metrohm

Program version viva 2.0 - 54
2016-08-12 13:11:58 UTC+2

Method parameters

Method VoltIC Professional 1
Method saving date 2016-08-12 13:11:06 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 test on

Application note

Sample data variables

Name	Type	Assignment	Fixed value	Comment	Monitoring
IDENT	Text			Sample identification 1	off
POSITION	Text			Sample identification 2	off
INFO 1	Text			Sample identification 3	off
Sample type	Text	Sample type		Sample type	off
Sample amount	Number	Sample amount	10	Sample amount	off
Sample amount unit	Text	Sample amount unit		Sample amount unit	off
Sample position	Number	Sample position		Sample position	off
ID4	Text	ID4			off
ID5	Text	ID5			off
ID6	Text	ID6			off
ID7	Text	ID7			off

Name IDENT
Type Text
Assignment off.
Fixed value on.
Check at start off



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Comment Sample identification 1

Name **POSITION**
Type Text
Assignment off.
Fixed value on.
Check at start off
Comment Sample identification 2

Name **INFO 1**
Type Text
Assignment off.
Fixed value on.
Check at start off
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 **ID4**
Type Text
Assignment on. ID4
Fixed value off.
Check at start off
Comment

Name **ID5**
Type Text
Assignment on. ID5
Fixed value off.
Check at start off
Comment

Name **ID6**
Type Text
Assignment on. ID6
Fixed value off.



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Check at start off
Comment

Name **ID7**
Type Text
Assignment on. ID7
Fixed value off.
Check at start off
Comment

Name **Sample amount**
Type Number
Assignment on. Sample amount
Fixed value on. 10
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 3' - command 'Main track'
Acoustic signal off
Action off
Cancel determination on
Cancel determination and series off

Name **Sample position**
Type Number
Assignment on. Sample position
Fixed value off.
Check at start on
Comment Sample position
Variable monitoring off
Lower limit
Upper limit
Message
Display message on
Record message on
Message by e-mail off
 E-mail template



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Subject Message from viva - method 'T_ASV determ (DP, standard
addition) semiautomatd2' - command 'Main track'
Acoustic signal off
Action off
Cancel determination on
Cancel determination and series off

TRANSFER Ready check

Device
Device name RS 232 device_1
Device type RS 232 device
Transfer commands

Name	Action	Command	Variable	Comparison
Ready?	Wait for		not defined	Ready?
Yes	Write	Yes		
Ident MN	Read		SD.IDENT	
Ok	Write	Ok		
Position MN	Read		SD.POSITION	
Ok	Write	Ok		
Info 1 MN	Read		SD.INFO 1	
Ok	Write	Ok		
Timeout				off

CALL Call sample

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

CALL Call additions

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

VA TRACK VA track

Return immediately off

LOOP Replications

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



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DP

ASV

General/Hardware

Device

Device name 884_1
Device type 884 Professional VA

Sensors/Electrodes

Working electrode MME
Sensor type MME
Operating mode HMDE
Drop size 4
Reference electrode Reference electrode
Auxiliary electrode Auxiliary electrode
Electrode test on

Stirrer

Stirring rate 2000 min⁻¹

Pretreatment

Stirring time 5.0 s

Cyclovoltammetric pretreatment

Start potential -1.2 V
Vertex potential -0.100 V
Sweep rate 1 V/s
Cycles off
Duration - s

Potentiostatic pretreatment

Potential 1 -1.15 V
Waiting time 1 90.0 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 -1.15 V
End potential 0.15 V
Potential step 0.006 V
Potential step time 0.1 s
Sweep rate 0.060 V/s
Pulse amplitude 0.05 V
Pulse time 0.04 s
Measuring time 0.02 s
Sweep duration 21.67 s



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Post-treatment

Cleaning

Cleaning potential off V
Cleaning time 0.0 s

Standby potential

Standby potential off V

Potentiostat

Current measuring range

Highest range 2 mA
Lowest range 2 μ A
Automatically select optimum current measuring range on

TRACK

Sample

Return immediately off
Delete old data off

TRANSFER

Sampler ready

Device

Device name RS 232 device_1
Device type RS 232 device

Transfer commands

Name	Action	Command	Variable	Comparison
Sampler ready	Wait for		not defined	Sampler ready
Timeout				off

STIR & PURGE

During sample transfer

Device

Device name 884_1
Device type 884 Professional VA

Stir

Stirring rate 2000 min⁻¹
Switch on on
Switch off off
Duration off

Purge

Switch on on
Switch off off
Duration off

TRANSFER

Transfer sample finished

Device

Device name RS 232 device_1
Device type RS 232 device

Transfer commands



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Name	Action	Command	Variable	Comparison
Transfer sample finished	Wait for		not defined	Transfer sample finished
Timeout				off

ADD SAMPLE

Add sample

Addition

Add manually off
Already added on
Add with dosing device off

ADD AUX

Add electrolyte

Auxiliary solution

Solution Electrolyte
Volume 1 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

ELECTRODE TEST

Electrode test

Device

Device name 884_1
Device type 884 Professional VA

Sensors/Electrodes

Working electrode MME
Sensor type MME

Stirrer

Stirring rate 2000 min⁻¹

STIR & PURGE

Initial purge

Device

Device name 884_1
Device type 884 Professional VA

Stir

Stirring rate 2000 min⁻¹
Switch on on
Switch off off
Duration off

Purge

Switch on off



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Switch off off
Duration on
Time 180 s

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 Standard

Addition increments

Number 1
Addition volume 1 0.020 mL

Addition

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

STIR & PURGE Addition purge

Device

Device name 884_1
Device type 884 Professional VA

Stir

Stirring rate 2000 min⁻¹
Switch on on
Switch off off
Duration off

Purge

Switch on off
Switch off off
Duration on
Time 30 s



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CALL VA Measure additions

Call text Measure additions
Track name VA track
Condition off

TRACK Shut off

Return immediately off
Delete old data off

STIR & PURGE STIR & PURGE OFF

Device

Device name 884_1
Device type 884 Professional VA

Stir

Stirring rate 2000 min⁻¹
Switch on off
Switch off on
Duration off

Purge

Switch on off
Switch off on
Duration off

MAIN VALVE N2 OFF

Device

Device name 884_1
Device type 884 Professional VA

Action

Open off
Close on

TRACK DU Standard

Return immediately off
Delete old data off

LQH Fill DU Standard General/Hardware

Dosing device

Dosing unit 2 mL Standard

Parameters

Function Fill
Port 2
Rate maximum mL/min

TRACK DU Electrolyte

Return immediately off
Delete old data off

Fill DU Electrolyte



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LQH General/Hardware

Dosing device

Dosing unit 5 mL Electrolyte

Parameters

Function Fill

Port 2

Rate maximum mL/min

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 Standard	DU Standard	off Sample	off
Fill DU Electrolyte	DU Electrolyte	off Sample	off

TRANSFER Result transfer

Device

Device name RS 232 device_1

Device type RS 232 device

Transfer commands

Name	Action	Command	Variable	Comparison
Will start transfer	Write	Will start transfer		
Ok	Wait for		not defined	Ok
Result Zn	Write	[= Case(Error('RS.ASV.Zn. CONC'); "N/A"; 'RS.ASV.Zn. CONC')]		
Ok	Wait for		not defined	Ok
Result Cd	Write	[= Case(Error('RS.ASV.Cd. CONC'); "N/A"; 'RS.ASV.Cd. CONC')]		
Ok	Wait for		not defined	Ok



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Name	Action	Command	Variable	Comparison
Result Pb	Write	[= Case(Error('RS.ASV.Pb. CONC'); "N/A"; 'RS.ASV.Pb. CONC')]		
Ok	Wait for		not defined	Ok
Result Cu	Write	[= Case(Error('RS.ASV.Cu. CONC'); "N/A"; 'RS.ASV.Cu. CONC')]		
Ok	Wait for		not defined	Ok
Timeout on				
Time 10 min				

ERROR Error track

CALL Error shut off

Call text	Track name	Sample type	Condition
Error shut off	Shut off	off Sample	off

TRANSFER Error transfer

Device
Device name RS 232 device_1
Device type RS 232 device
Transfer commands

Name	Action	Command	Variable	Comparison
Will start transfer	Write	Will start transfer		
Ok	Wait for		not defined	Ok
Result Zn	Write	Error		
Ok	Wait for		not defined	Ok
Result Cd	Write	Error		
Ok	Wait for		not defined	Ok
Result Pb	Write	Error		
Ok	Wait for		not defined	Ok
Result Cu	Write	Error		
Ok	Wait for		not defined	Ok
Timeout on				
Time 10 min				

Evaluation parameters



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General

ASV

Data processing

Smoothing 1

Reversed peaks off

Curve evaluation

Fixed point evaluation off

Substances

ASV

Substances - Recognition

Substance	Active	Characteristic potential	Tolerance	Min. width	Max. width	Min. measured quantity
Zn	on	-1.0 V	0.05 V	0.01 V	0.5 V	200 pA
Cd	on	-0.6 V	0.05 V	0.01 V	0.5 V	200 pA
Pb	on	-0.4 V	0.05 V	0.01 V	0.5 V	200 pA
Cu	on	0.0 V	0.05 V	0.01 V	0.5 V	200 pA

ASV

Substances - Baseline

Substance	Baseline type	Start base point	End base point
Zn	Linear	Automatically	Automatically
Cd	Linear	Automatically	Automatically
Pb	Linear	Automatically	Automatically
Cu	Linear	Automatically	Automatically

Standards

Standards

Name	Standard
------	----------

Zn	2.5 mg/L
Cd	0.1 mg/L
Pb	0.5 mg/L
Cu	5 mg/L

Calibration

General

Calibration method Standard addition

Blank value correction with evaluation off
quantity

ASV

Calibration curves

Substance	Evaluation quantity	Curve type	Weighting
Zn	Height	Linear regression	on
Cd	Height	Linear regression	on
Pb	Height	Linear regression	on
Cu	Height	Linear regression	on

Results

Substance concentration in the sample

ASV

Substance	Decimal places	Assignment
Zn	2	RS01
Cd	2	RS02
Pb	2	RS03
Cu	2	RS04

Results

Additional results

Result	Places	Prefix	Unit
Peak potential	3		V
Height	2	#	A
RSD of the heights 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		
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	#	



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Result	Places	Prefix	Unit
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

Result type	Result name	Formula	Unit	Decimal places	Assignment	Description
Single result	Ident	= Trim('SD.IDENT')		0	RS05	
Single result	Position	= TextToNumber('SD.POSITION')		0	RS06	
Single result	Info 1	= 'SD.INFO 1'		0	RS07	

Database

Name database viva