



License ID 459712
Client ID 001-NBK-00558
User Metrohm

Program version viva 2.0 - 54
2017-05-30 08:32:02 UTC+2

Method parameters

Method AB 429 Determination of Cu
Method saving date 2017-05-30 08:31:45 UTC+2
Method version 1
Method group viva example methods
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

Measuring solution: 10 mL (diluted) sample 2 mL electrolyte (c(KCl) = 0.3 mol/L, c(HCl) = 0.1 mol/L)

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 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.
Check at start on



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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 amount**

Type Number

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 3' - command 'Main track'

Acoustic signal off

Action off

Cancel determination on

Cancel determination and series off

Command comment

AB 429/1: Determination of copper with the scTRACE Gold

Call sample



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CALL

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

DP**ASV****General/Hardware**

Device

Device name 884_1
Device type 884 Professional VA

Sensors/Electrodes

Working electrode scTRACE Gold
Sensor type scTRACE Gold
Reference electrode Reference electrode
Auxiliary electrode Auxiliary electrode
Electrode test on

Stirrer

Stirring rate 2000 min⁻¹
Hydrodynamic measurement off

Pretreatment

Stirring time 10 s

Cyclovoltammetric pretreatment

Start potential 0 V
Vertex potential 0.75 V
Sweep rate 1 V/s
Cycles 5
Duration 7.50 s

Potentiostatic pretreatment

Potential 1 0.75 V
Waiting time 1 10 s
Potential 2 -0.3 V



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Waiting time 2 30 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 10 s

Sweep

Start potential -0.1 V
End potential 0.6 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 0.01 s
Sweep duration 11.67 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 2 mA
Lowest range 20 μ A
Automatically select optimum current measuring range on

VA TRACK Dummy meas

Return immediately off

DP

Dummy sweep

General/Hardware

Device

Device name 884_1
Device type 884 Professional VA

Sensors/Electrodes

Working electrode scTRACE Gold
Sensor type scTRACE Gold
Reference electrode Reference electrode
Auxiliary electrode Auxiliary electrode
Electrode test on

Stirrer

Stirring rate 2000 min⁻¹



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Hydrodynamic measurement off

Pretreatment

Stirring time 0 s

Cyclovoltammetric pretreatment

Start potential 0 V

Vertex potential 0.75 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 3 s

Sweep

Start potential 0.1 V

End potential 0.4 V

Potential step 0.01 V

Potential step time 0.1 s

Sweep rate 0.100 V/s

Pulse amplitude 0.05 V

Pulse time 0.04 s

Measuring time 0.01 s

Sweep duration 3.00 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 2 mA

Lowest range 20 μ A

Automatically select optimum current measuring range on

TRACK

Sample

Return immediately off

Delete old data off



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**ADD
SAMPLE**

Add sample

Addition

Add manually on
Display standard message on
Display message defined by the user off
Already added off
Add with dosing device off

ADD AUX

Add electrolyte

Auxiliary solution

Solution Electrolyte
Volume 2 mL
Include volume in calculation on

Addition

Add manually on
Display standard message on
Display message defined by the user off
Already added off
Add with dosing device off

**STIR &
PURGE**

Initial mixing

Device

Device name 884_1
Device type 884 Professional VA

Stir

Stirring rate 2000 min⁻¹
Switch on off
Switch off off
Duration on
Time 10 s

Purge

Switch on off
Switch off on
Duration off

CALL VA

Call Dummy sweep

Call text Call Dummy sweep
Track name Dummy meas
Condition off

CALL VA

Measure sample

Call text Measure sample
Track name VA track
Condition off

TRACK

Standard addition

Return immediately off
Delete old data off



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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 0.05 mL

Addition

Add manually on
Display standard message on
Display message defined by the user off
Already added off
Add with dosing device off

**STIR &
PURGE****Addition mixing**

Device

Device name 884_1
Device type 884 Professional VA

Stir

Stirring rate 2000 min⁻¹
Switch on off
Switch off off
Duration on
Time 10 s

Purge

Switch on off
Switch off on
Duration off

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



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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

EXIT

Exit track

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

ASV

Data processing

Smoothing 1
Reversed peaks off

Curve evaluation

Fixed point evaluation off

Dummy sweep

Data processing



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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
Cu	on	0.25 V	0.05 V	0.01 V	0.3 V	200 pA

ASV

Substances - Baseline

Substance	Baseline type	Start base point	End base point
Cu	Linear	Automatically	Automatically

Dummy sweep

Substances - Recognition

Dummy sweep

Substances - Baseline

Standards

Standards

Name Standard

Cu 1 mg/L

Calibration

General

Calibration method Standard addition
Blank value correction with evaluation off
quantity

ASV

Calibration curves

Substance	Evaluation quantity	Curve type	Weighting
Cu	Height	Linear regression	on



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Dummy sweep

Calibration curves

Results

Substance concentration in the sample

ASV

Substance	Decimal places	Assignment
Cu	3	RS01

Substance concentration in the sample

Dummy sweep

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	#	
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