



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

Program version viva 2.0 - 54  
2018-10-01 08:58:14 UTC+2

## Method parameters

Method . . . . . AB 433 Plating Ag film  
Method saving date . . . . . 2018-10-01 08:58:04 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

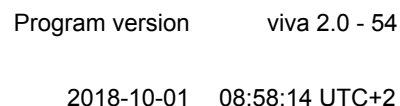
Measuring solution: 10 mL ultrapure water 1 mL plating electrolyte 1 mL  $\beta(\text{Ag}) = 20$  mg/L  
Plating electrolyte: c(sulfosalicylic acid) = 0.4 mol/L, c(NaOH) = 1 mol/L

#### 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



### Add H<sub>2</sub>O



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

Program version viva 2.0 - 54  
2018-10-01 08:58:14 UTC+2

**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 plating electrolyte**

**Auxiliary solution**

Solution . . . . . SSA solution  
Volume . . . . . 1 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

**ADD AUX**

**Add Ag solution**

**Auxiliary solution**

Solution . . . . . Ag solution  
Volume . . . . . 1 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 purge**

**Device**

Device name . . . . . 884\_1  
Device type . . . . . 884 Professional VA

**Stir**

Stirring rate . . . . . 2000 min<sup>-1</sup>  
Switch on . . . . . on  
Switch off . . . . . off  
Duration . . . . . off

**Purge**

Switch on . . . . . off  
Switch off . . . . . off  
Duration . . . . . on  
Time . . . . . 90 s



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

Program version viva 2.0 - 54  
2018-10-01 08:58:14 UTC+2

**CALL VA Ag film plating**

Call text . . . . . Ag film plating  
Track name . . . . . VA track  
Condition . . . . . off

**VA TRACK VA track**

Return immediately . . . . . off

**CVS Electrode pretreatment**

**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 test . . . . . on

**Stirrer**

Stirring rate . . . . . 2000 min<sup>-1</sup>  
Hydrodynamic measurement . . . . . off

**Pretreatment**

Stirring time . . . . . 5.0 s

**Cyclovoltammetric pretreatment**

Start potential . . . . . -0.5 V  
Vertex potential . . . . . 0.4 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 . . . . . -0.5 V  
1st vertex potential . . . . . 0.4 V  
2nd vertex potential . . . . . -0.5 V



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

Program version viva 2.0 - 54  
2018-10-01 08:58:14 UTC+2

Potential step . . . . . 0.01 V  
Potential step time . . . . . 0.100 s  
Sweep rate . . . . . 0.100 V/s  
Preparation cycles . . . . . 0  
Measuring cycles . . . . . 3  
Sweep duration . . . . . 54.60 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  $\mu$ A

### CVS

#### Ag plating

##### 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 test . . . . . on

###### Stirrer

Stirring rate . . . . . 2000 min<sup>-1</sup>  
Hydrodynamic measurement . . . . . off

#### Pretreatment

Stirring time . . . . . 5.0 s

##### Cyclovoltammetric pretreatment

Start potential . . . . . -0.5 V  
Vertex potential . . . . . 0.4 V  
Sweep rate . . . . . 1 V/s  
Cycles . . . . . off  
Duration . . . . . - s

##### Potentiostatic pretreatment

Potential 1 . . . . . -1.0 V  
Waiting time 1 . . . . . 60 s  
Potential 2 . . . . . off V  
Waiting time 2 . . . . . 0.0 s  
Potential 3 . . . . . off V  
Waiting time 3 . . . . . 0.0 s



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

Program version viva 2.0 - 54  
2018-10-01 08:58:14 UTC+2

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 . . . . . -0.4 V  
1st vertex potential . . . . . -0.1 V  
2nd vertex potential . . . . . -0.4 V  
Potential step . . . . . 0.01 V  
Potential step time . . . . . 0.100 s  
Sweep rate . . . . . 0.100 V/s  
Preparation cycles . . . . . 0  
Measuring cycles . . . . . 1  
Sweep duration . . . . . 6.20 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  $\mu$ A

#### 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<sup>-1</sup>  
Switch on . . . . . off  
Switch off . . . . . on  
Duration . . . . . off

###### Purge

Switch on . . . . . off  
Switch off . . . . . on  
Duration . . . . . off

#### MAIN VALVE

##### Main valve OFF

###### Device

Device name . . . . . 884\_1



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

Program version viva 2.0 - 54  
2018-10-01 08:58:14 UTC+2

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

#### Ag plating

##### Data processing

Smoothing . . . . . 1  
Reversed peaks . . . . . off

##### Curve evaluation

Fixed point evaluation . . . . . off

#### Electrode pretreatment

##### Data processing

Smoothing . . . . . 1  
Reversed peaks . . . . . off

##### Curve evaluation

Fixed point evaluation . . . . . off

### Substances

#### Ag plating

##### Substances - Recognition

#### Ag plating

##### Substances - Baseline



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

Program version viva 2.0 - 54  
2018-10-01 08:58:14 UTC+2

**Electrode pretreatment**  
**Substances - Recognition**

**Electrode pretreatment**  
**Substances - Baseline**

**Ag plating**  
**Calibration curves**

**Electrode pretreatment**  
**Calibration curves**

**Results**

**Substance concentration in the sample**

**Ag plating**

**Substance concentration in the sample**

**Electrode pretreatment**

**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	#	





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

Program version viva 2.0 - 54  
2018-10-01 08:58:14 UTC+2

Result	Places	Prefix	Unit
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