



## Method parameters

Method . . . . . AB445 – Maintenance - Electrochemical cleaning

Method saving date . . . . . 2024-06-28 08:50:22 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 check . . . . . off

#### Application note

Note! Electrolyte alkaline is used for the electrochemical cleaning of the electrodes.  
Repetition of the cleaning measurement will stop when the relative standard deviation of the current at +0.9 V for the last two curves is less than 3%, or after 10 replications.

#### Sample data variables

| Name | Type | Assignment | Fixed value   | Comment                 | Monitoring |
|------|------|------------|---------------|-------------------------|------------|
| ID1  | Text | ID1        | Electrochemic | Sample identification 1 | off        |
| ID2  | Text | ID2        |               | Sample identification 2 | off        |
| ID3  | Text | ID3        |               | Sample identification 3 | off        |

Name . . . . . ID1

Type . . . . . Text

Assignment . . . . . on, . . . . . ID1

Fixed value . . . . . on, . . . . . Electrochemical cleaning

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

Name . . . . . ID3



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Type . . . . . Text  
Assignment . . . . . on. . . . . ID3  
Fixed value . . . . . off. . . . .  
Check at start . . . . . on  
Comment . . . . . Sample identification 3

**Command comment**

AB-445/1: MVA-25 - Electrochemical cleaning of electrodes

**CALL Empty measuring vessel**

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

**LQH Dose cleaning alkaline**

**General/Hardware**

**Dosing device**

Dosing unit . . . . . Electrolyte alkaline

**Parameters**

Function . . . . . Dosing  
Port . . . . . 3  
Volume . . . . . 5 mL  
Rate . . . . . maximum mL/min

**CALL COND Condition electrodes**

Call text . . . . . Condition electrodes  
Track name . . . . . VA track  
Stop criteria  
Evaluation quantity . . . . . on  
Voltammetry command . . . . . Sweep DP  
Substance . . . . . I@900mV  
Standard deviation . . . . . 3 %  
Number of runs . . . . . on  
Number of runs . . . . . 10  
Action . . . . . Cancel command  
Run time . . . . . off  
Condition . . . . . off

**CALL VA Cleaning measurement**

Call text . . . . . Cleaning measurement  
Track name . . . . . VA track  
Condition . . . . . off

**CALL Rinse measuring vessel**



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| Call text      | Track name     | Sample type | Condition |
|----------------|----------------|-------------|-----------|
| Rinsing cycles | Rinsing Cycles | off Sample  | off       |

**VA TRACK VA track**

Return immediately . . . . . off

**DP**

**Sweep DP**

**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 . . . . . off

**Stirrer**

Stirring rate . . . . . 2000 min<sup>-1</sup>

Hydrodynamic measurement . . . . . off

**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 . . . . . 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 . . . . . -0.1 V

End potential . . . . . 1 V

Potential step . . . . . 0.006 V



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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 . . . . . 18.33 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 µA  
Automatically select optimum current measuring range . . . . . on

**TRACK**

**Rinsing Cycles**

Return immediately . . . . . off  
Delete old data . . . . . off

**STIR &  
PURGE**

**Stirrer ON**

**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 . . . . . on  
Duration . . . . . off

**LOOP**

**LOOP Rinsing**

**Stop criteria**

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

**CALL**

**CALL Drain**



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|       |                              |            |             |  |
|-------|------------------------------|------------|-------------|--|
|       | 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 | Drain                        |            |             |  |
|       | Return immediately . . . . . |            |             | off                                    |
|       | Delete old data . . . . .    |            |             | off                                    |
| PUMP  | Pump - Drain                 |            |             |  |
|       | Device                       |            |             |  |
|       | Device name . . . . .        |            |             | 858 Sample Processor                   |
|       | Device type . . . . .        |            |             | 858.0020 Professional Sample Processor |
|       | Pumps                        |            |             |  |
|       | Tower . . . . .              |            |             | 1                                      |
|       | Pump(s) . . . . .            |            |             | 1                                      |
|       | Action                       |            |             |  |
|       | Switch on . . . . .          |            |             | off                                    |
|       | Switch off . . . . .         |            |             | off                                    |
|       | Duration . . . . .           |            |             | on                                     |
|       | Time . . . . .               |            |             | 15 s                                   |
| TRACK | Rinse                        |            |             |  |
|       | Return immediately . . . . . |            |             | off                                    |
|       | Delete old data . . . . .    |            |             | off                                    |
| PUMP  | Pump - Rinse                 |            |             |  |
|       | Device                       |            |             |  |
|       | Device name . . . . .        |            |             | 858 Sample Processor                   |
|       | Device type . . . . .        |            |             | 858.0020 Professional Sample Processor |
|       | Pumps                        |            |             |  |
|       | Tower . . . . .              |            |             | 1                                      |
|       | Pump(s) . . . . .            |            |             | 2                                      |
|       | Action                       |            |             |  |
|       | Switch on . . . . .          |            |             | off                                    |
|       | Switch off . . . . .         |            |             | off                                    |
|       | Duration . . . . .           |            |             | on                                     |
|       | Time . . . . .               |            |             | 4 s                                    |
| TRACK | Shut off                     |            |             |  |
|       | Return immediately . . . . . |            |             | off                                    |
|       | Delete old data . . . . .    |            |             | off                                    |



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## PUMP

### Pumps OFF

#### Device

Device name . . . . . 858 Sample Processor  
Device type . . . . . 858.0020 Professional Sample Processor

#### Pumps

Tower . . . . . 1  
Pump(s) . . . . . 1+2

#### Action

Switch on . . . . . off  
Switch off . . . . . on  
Duration . . . . . off  
Time . . . . . 8.0 s

## 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

## LQH

### DU Electrolyte alkaline

#### General/Hardware

##### Dosing device

Dosing unit . . . . . Electrolyte alkaline

##### Parameters

Function . . . . . Fill  
Port . . . . . 2  
Rate . . . . . maximum mL/min

## EXIT

### Exit track

## CALL

### Exit shut off

| Call text | Track name | Sample type | Condition |
|-----------|------------|-------------|-----------|
| Shut off  | Shut off   | off Sample  | off       |

## ERROR

### Error track



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## CALL Error shut off

| Call text | Track name | Sample type | Condition |
|-----------|------------|-------------|-----------|
| Shut off  | Shut off   | off Sample  | off       |

## Evaluation parameters

### General

#### Sweep DP

#### Data processing

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

#### Curve evaluation

Fixed point evaluation . . . . . off

### Substances

#### Sweep DP

#### Substances - Recognition

| Substance | Active | Characteristic potential | Tolerance | Min. width | Max. width | Min. measured quantity |
|-----------|--------|--------------------------|-----------|------------|------------|------------------------|
| I@900mV   | on     | 0.9 V                    | 0.05 V    | 0.01 V     | 0.5 V      | 200 pA                 |

#### Sweep DP

#### Substances - Baseline

| Substance | Baseline type  | Start base point | End base point |
|-----------|----------------|------------------|----------------|
| I@900mV   | Measured value | Automatically    | Automatically  |

#### Sweep DP

#### Calibration curves

### Results

#### Substance concentration in the sample

#### Sweep DP

| Substance | Decimal places | Assignment |
|-----------|----------------|------------|
| I@900mV   | 3              | none       |

### Results

#### Additional results



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| 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

| Result type   | Result name      | Formula  | Unit | Decimal places | Assignment | Description |
|---------------|------------------|--|------|----------------|------------|-------------|
| Single result | Current @900mV   | = 'RS.Sweep DP.<br>I@900mV.VAR{1}.<br>MVAL.MNV' *<br>1000000 | µA   | 2              | RS01       |             |
| Single result | RSD Conditioning | = 'Condition<br>electrodes.SDV'                              | %    | 2              | RS02       |             |

#### Database

Name database . . . . . viva