Method parameters

Method . . . . . Calibrating the pH glass electrode
Method saving date . . . . . 2019-08-01 11:09:34 UTC+3
Method version 15
Method group . . . . . Main group
Method status . . . . . original
Method saved by (full name) . . . . .
Method saved by (short name) . . . . . Admin

START **Main track**

General

Workplace view
Current view . . . . . on
Track view for live window
Live display 1 . . . . . Main track
Live display 2 . . . . . Main track
Statistics . . . . . off
Conditioning
Automatic conditioning . . . . . off

Application note

Calibrating the pH Glass Electrode This is a method to calibrate a pH glass electrode. It consists of three different tracks. In the series start track the rack is initialised and the system prepared for the measurement. Additionally the electrode is removed from the storage beaker and rinsed thoroughly. The main track deals the calibration measurements followed by the rinsing of the electrode. After the measurements the results are calculated, a report is printed and the data saved in the previously defined database 'Robotic Acid Base Analyzer' (can be modified). Procedure: Fill three beakers with Metrohm buffer solutions pH 4, 7 and 9. Make sure that the electrode is properly immersed in the buffer solution. The spec ial beaker for storing the electrode has to be filled with Metrohm storage solution. Remark: To run this method the settings of the 855 Robotic Titrosampler have to be adjusted. The lift positions have to be defined according to the rack and beakers used. As the robotic swing arm is equipped with a sensor the head has to touch the beaker brim when moving to the work position. If this requirement can not be fulfilled no beaker will be recognised. Two special beakers have to be defined including their own work positions. Special beaker 2 is used for rinsing the electrode while special beaker 1 contains storage solution for a proper electrode treatment between the determination series.

Method variables

Name	Type	Assignment	Fixed value	Comment	Monitoring
Sample size	Number	Sample size		Sample size	off
Sample size unit	Text	Sample size unit		Sample size unit	off
Sample position	Number	Sample position		Sample position number	off
ID1	Text	ID1		Sample identification 1	off
ID2	Text	ID2		Sample identification 2	off
ID3	Text	ID3		Sample identification 3	off

Name	**Sample size**
Type	Number
Assignment	on. Sample size
Fixed value	off.
Check at start	on
Comment	Sample size
Variable monitoring	off
Lower limit	
Upper limit	
Message	
Display message	on
Record message	on
Message by e-mail	off
Use e-mail template	off
E-mail template	
Mail to	
Subject	Message from tiamo - Method 'New method 1' - Command 'Main track'
User	
Mail from	
SMTP Server	
POP3 Server	
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 number
Variable monitoring	off
Lower limit	
Upper limit	
Message	
Display message	on
Record message	on
Message by e-mail	off
Use e-mail template	off
E-mail template	
Mail to	
Subject	Message from tiamo - Method 'New method 1' - Command 'Main track'
User	

Mail from
SMTP Server
POP3 Server
Acoustic signal . . . off
Action . . . off
Cancel determination . . . on
Cancel determination and series . . . off

Name . . . **Sample size unit**
Type . . . Text
Assignment . . . on . . . Sample size unit
Fixed value . . . off
Check at start . . . on
Comment . . . Sample size unit

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

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

CAL LOOP pH **calibration loop pH**

Buffers
Number of buffers . . . 3
Buffer type . . . Special
Buffer 1 pH . . . 4
Buffer 2 pH . . . 7.02
Buffer 3 pH . . . 10.06
Request for buffer exchange . . . off
Subsequent command . . . calculation

PreBuffer

MOVE Device

Device name . . . . . 855_1
Device type . . . . . 855 Robotic Titrosampler
Target
Tower 1
Move . . . . . Rack position
Number . . . . . =0+ 'calibration loop pH.LCO'
Beaker test
Display message . . . . . off
Cancel determination . . . . . off
Cancel determination and series . . . . . on
Parameters
Shift rate . . . . . 20 °/s
Shift direction . . . . . auto
Swing rate . . . . . 55 °/s

LIFT **LIFT 6**

Device
Device name . . . . . 855_1
Device type . . . . . 855 Robotic Titrosampler
Target
Tower 1
Lift position . . . . . Work position mm
Parameters
Lift rate . . . . . 25 mm/s

STIR **STIR 7**

Device
Device name . . . . . 855_1
Device type . . . . . 855 Robotic Titrosampler
Stirrer
Stirrer 1
Stirrer type . . . . . unknown
Stirring rate 5
Action
Switch on . . . . . off
Switch off . . . . . off
Duration . . . . . on
Time . . . . . 10.0 s

LIFT **LIFT 8**

Device
Device name . . . . . 855_1
Device type . . . . . 855 Robotic Titrosampler
Target
Tower 1

Lift position . . . . . Shift position mm
Parameters
Lift rate . . . . . 25 mm/s

MOVE **to sample**
Device
Device name . . . . . 855_1
Device type . . . . . 855 Robotic Titrosampler
Target
Tower 1
Move . . . . . Rack position
Number . . . . . =3 + 'calibration loop pH.LCO'
Beaker test
Display message . . . . . off
Cancel determination . . . . . off
Cancel determination and series . . . . . on
Parameters
Shift rate . . . . . 20 °/s
Shift direction . . . . . auto
Swing rate . . . . . 55 °/s

LIFT **LIFT 3**
Device
Device name . . . . . 855_1
Device type . . . . . 855 Robotic Titrosampler
Target
Tower 1
Lift position . . . . . Work position mm
Parameters
Lift rate . . . . . 25 mm/s

CAL MEAS pH **CAL MEAS pH**
General/Hardware
Device
Device name . . . . . 855_1
Device type . . . . . 855 Robotic Titrosampler
Sensor
Measuring input 1
Sensor . . . . . pH electrode
Temperature measurement . . . . . automatic
Stirrer
Stirrer 1
Stirring rate 5
Switch off automatically . . . . . on
Measuring parameters
Measurement with drift control
Signal drift . . . . . 1 mV/min

Min. waiting time . . . . . 30 s
Max. waiting time . . . . . 154 s
Measuring interval . . . . . 2.0 s
Temperature
Temperature . . . . . 21 °C

MOVE **to rinsing beaker**

Device
Device name . . . . . 855_1
Device type . . . . . 855 Robotic Titrosampler
Target
Tower 1
Move . . . . . Special beaker
Number 1
Beaker test
Display message . . . . . off
Cancel determination . . . . . on
Cancel determination and series . . . . . off
Parameters
Shift rate . . . . . 20 °/s
Shift direction . . . . . auto
Swing rate . . . . . 55 °/s

LIFT **LIFT 4**

Device
Device name . . . . . 855_1
Device type . . . . . 855 Robotic Titrosampler
Target
Tower 1
Lift position . . . . . Work position mm
Parameters
Lift rate . . . . . 25 mm/s

PUMP **rinse and aspirate**

Device
Device name . . . . . 855_1
Device type . . . . . 855 Robotic Titrosampler
Pumps
Tower 1
Pump(s) 1
Action
Switch on . . . . . off
Switch off . . . . . off
Duration . . . . . on
Time . . . . . 3 s

calculation

CALC

Result name	Formula	Unit	Decimal places	Assignment	Statistics
slope	= 'calibration loop pH.SLO'	%	2	RS01	off
zero point	= 'calibration loop pH.ENP'		2	RS02	off

Result name . . . . . **slope**
Formula . . . . . = 'calibration loop pH.SLO'
Unit . . . . . %
Decimal places 2
Assignment RS01
Statistics . . . . . off
Description . . . . . RS.'Result name'[.VAL] Result value.
Result monitoring . . . . . off
Save result as common variable . . . . . off
Common variable . . . . .
Save result as titer . . . . . off
Solution name . . . . .

Result name . . . . . **zero point**
Formula . . . . . = 'calibration loop pH.ENP'
Unit . . . . .
Decimal places 2
Assignment RS02
Statistics . . . . . off
Description . . . . . RS.'Result name'[.VAL] Result value.
Result monitoring . . . . . off
Save result as common variable . . . . . off
Common variable . . . . .
Save result as titer . . . . . off
Solution name . . . . .

REPORT **report**

Report template
Report template . . . . . calibration report
Report output
Printer . . . . . off
PDF file . . . . . off

DATABASE **database**

Database
tiamo

SERIES START **Series start track**

RACK **initialize rack**

Device
- Device name . . . . . 855_1
- Device type . . . . . 855 Robotic Titrosampler

Rack test . . . . . off

MOVE **to rinse beaker**

Device
- Device name . . . . . 855_1
- Device type . . . . . 855 Robotic Titrosampler

Target
- Tower 1
- Move . . . . . Special beaker
- Number 1

Beaker test
- Display message . . . . . off
- Cancel determination . . . . . on
- Cancel determination and series . . . . . off

Parameters
- Shift rate . . . . . 20 °/s
- Shift direction . . . . . auto
- Swing rate . . . . . 55 °/s

LIFT **LIFT 2**

Device
- Device name . . . . . 855_1
- Device type . . . . . 855 Robotic Titrosampler

Target
- Tower 1
- Lift position . . . . . Rinse position mm

Parameters
- Lift rate . . . . . 25 mm/s

PUMP **aspirate and rinse**

Device
- Device name . . . . . 855_1
- Device type . . . . . 855 Robotic Titrosampler

Pumps
- Tower 1
- Pump(s) 1

Action
- Switch on . . . . . off
- Switch off . . . . . off
- Duration . . . . . on
- Time . . . . . 5 s

Series end track

SERIES
END

MOVE **MOVE 9**

Device
- Device name . . . . . 855_1
- Device type . . . . . 855 Robotic Titrosampler

Target
- Tower 1
- Move . . . . . Special beaker
- Number 2

Beaker test
- Display message . . . . . on
- Cancel determination . . . . . off
- Cancel determination and series . . . . . off

Parameters
- Shift rate . . . . . 20 °/s
- Shift direction . . . . . auto
- Swing rate . . . . . 55 °/s

LIFT **LIFT 1**

Device
- Device name . . . . . 855_1
- Device type . . . . . 855 Robotic Titrosampler

Target
- Tower 1
- Lift position . . . . . Rinse position mm

Parameters
- Lift rate . . . . . 25 mm/s

STIR **STIR 10**

Device
- Device name . . . . . 855_1
- Device type . . . . . 855 Robotic Titrosampler

Stirrer
- Stirrer 1
- Stirrer type . . . . . unknown
- Stirring rate 8

Action
- Switch on . . . . . off
- Switch off . . . . . off
- Duration . . . . . on
- Time . . . . . 10.0 s