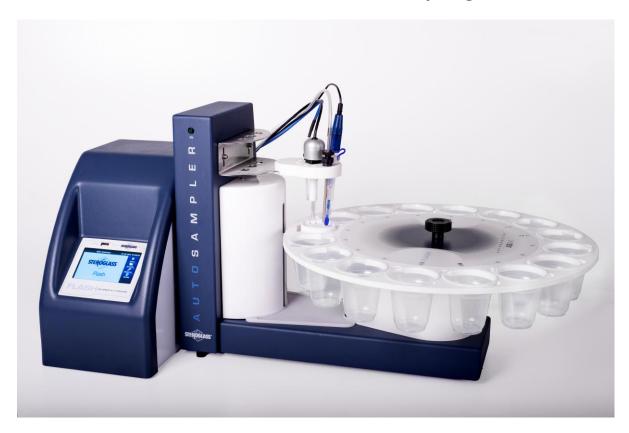


FLASH TITRATOR Standardization of NaOH with Potassium Hydrogen Phthalate



PRINCIPLE OF THE METHOD

The procedure for the standardization of soda allows us to determine the real concentration of NaOH that is being used as a titrant. Over time, soda tends to lose its titer because OH- can react with CO2 to form bicarbonate. Consequently the OH-carbonate fraction is no longer available to act as a titrant. Sodium hydroxide solutions can be standardized by titrating a known aliquot of potassium hydrogen phthalate ($C_8H_5KO_4$ - primary salt) using a combined pH electrode.



PREPARATION OF THE STANDARD

To standardize **0.1 M NaOH solutions**: weigh exactly an aliquot of a potassium hydrogen phthalate of about 0.1 g ($\pm 0.0001 \text{ g}$) directly into the titration vessel and add about 40 ml of distilled water (CO_2 -free).

To standardize **1 M NaOH solutions**: weigh exactly an aliquot of a potassium hydrogen phthalate of about 1.0 g ($\pm 0.0001 \text{ g}$) directly into the titration vessel and add about 40 ml of distilled water (CO₂-free).

To standardize solutions with intermediate concentrations between **0.1** and **1** M, weigh an aliquot of primary salt between **0.1** and **1** g (**e.g. approximately 0.25** g to standardize **0.25** M NaOH).

PRELIMINARY OPERATIONS

It is strictly necessary to first calibrate the electrode using pH 7.0 and 10.0 buffers.

PROCEDURE

In the Samples screen, enter the weight value measured with the scale in the "weight" field.

It is recommended that this standardization procedure be carried out on 3 phthalate samples: the standardization tests can be accessed from *Utility*, *Results*, and *Standard* and the average can be calculated. The average concentration value obtained can be saved in the test methods of interest that use NaOH as a titrant.

A specific STD NaOH standardization method can be created with the following parameters:



| Method NameNaOH StandardDescript./Sample no.SamplePump level N0Pump level sec.0Degassing sec:0Stirrer speed7Pre-stirring time40 secMeasurement typepHInitial auto-stability (pH)0.02Initial auto-stability time (s)5Initial addition0.00Initial stirring3Titrant burette2Addition typeProgressiveAddition (ml)0.25Limit volume (ml)10Polarization valueNAEnd Point value (pH)8.3Auto-stability (pH)0.05Auto-stability time (s)1Max. stability time (s)60End titration delay3Factor4.8964Concentration (mol/l)1.0Sample volume (ml)0.0Result unitFactorNumber decimals2Approaching factor250Blank (ml)0.000Washing typeWashing positionWashing time (s)5Reagent standardization51Equation typeDEFAULT | | 5 15 11 |
|--|---------------------------------|------------------|
| Pump level N Pump level sec. Degassing sec: O Stirrer speed Pre-stirring time Measurement type Initial auto-stability (pH) Initial auto-stability time (s) Initial stirring Titrant burette Addition (ml) Polarization value End Point value (pH) Auto-stability time (s) Indial stirring Initial volume (ml) Polarization value Indial stirring Initial s | Method Type | End Point |
| Pump level N Pump level sec. Degassing sec: O Stirrer speed 7 Pre-stirring time Measurement type Initial auto-stability (pH) Initial auto-stability time (s) Initial addition Initial stirring 3 Titrant burette 2 Addition type Addition (ml) Polarization value End Point value (pH) Auto-stability time (s) Indial stirring 10 Polarization value End Point value (pH) Auto-stability time (s) Indial stirring 10 Polarization value Indial stirring 10 Indial | | |
| Pump level sec. Degassing sec: Stirrer speed 7 Pre-stirring time Measurement type Initial auto-stability (pH) Initial auto-stability time (s) Initial stirring Titrant burette Addition (ml) Polarization value End Point value (pH) Auto-stability time (s) End titration delay Factor Concentration (mol/I) Sample volume (ml) Polarization value Result unit Factor Number decimals Approaching factor Blank (ml) Vashing type Washing type Value (s) Value (s) Value (s) Value (s) Vashing type Washing type Washing type Washing type Washing type Value (s) | | Sample |
| Degassing sec: Stirrer speed Pre-stirring time Measurement type Initial auto-stability (pH) Initial auto-stability time (s) Initial addition Initial stirring Titrant burette Addition (ml) Limit volume (ml) Polarization value End Point value (pH) Auto-stability time (s) End titration delay Factor Concentration (mol/l) Sample volume (ml) Result unit Nand Polarization Polarization (mol/l) Sample volume (ml) Result unit Pactor Approaching factor Blank (ml) Washing type Washing position Washing time (s) Reagent standardization SI | | - |
| Stirrer speed 7 Pre-stirring time 40 sec Measurement type pH Initial auto-stability (pH) 0.02 Initial auto-stability time (s) 5 Initial addition 0.00 Initial stirring 3 Titrant burette 2 Addition type Progressive Addition (ml) 0.25 Limit volume (ml) 10 Polarization value NA End Point value (pH) 8.3 Auto-stability (pH) 0.05 Auto-stability time (s) 1 Max. stability time (s) 5 End titration delay 3 Factor 4.8964 Concentration (mol/I) 1.0 Sample volume (ml) 0.0 Result unit Factor Number decimals 2 Approaching factor 250 Blank (ml) 0.000 Washing type Washing position Washing time (s) 5 Reagent standardization SI | - | 0 |
| Pre-stirring time 40 sec Measurement type pH Initial auto-stability (pH) 0.02 Initial auto-stability time (s) 5 Initial addition 0.00 Initial stirring 3 Titrant burette 2 Addition type Progressive Addition (ml) 10 Polarization value NA End Point value (pH) 8.3 Auto-stability time (s) 1 Max. stability time (s) 1 Max. stability time (s) 60 End titration delay 3 Factor 4.8964 Concentration (mol/l) 1.0 Sample volume (ml) 0.0 Result unit Factor Number decimals 2 Approaching factor 250 Blank (ml) 0.000 Washing type Washing position Washing time (s) 5 Reagent standardization SI | Degassing sec: | 0 |
| Measurement type Initial auto-stability (pH) Initial auto-stability time (s) Initial addition Initial stirring 3 Titrant burette 2 Addition type Addition (ml) Polarization value End Point value (pH) Auto-stability time (s) Imax. stability time (s) Index stability time (s) End titration delay Factor Concentration (mol/I) Sample volume (ml) Result unit Number decimals Approaching factor Blank (ml) Washing type Washing position Washing time (s) Reagent standardization J.00 J.0 | Stirrer speed | 7 |
| Initial auto-stability (pH) Initial auto-stability time (s) Initial addition Initial stirring Titrant burette Addition type Addition (ml) Polarization value End Point value (pH) Auto-stability time (s) Auto-stability time (s) Imax. stability time (s) End titration delay Factor Concentration (mol/I) Sample volume (ml) Result unit Number decimals Approaching factor Blank (ml) Value (s) Vashing time (s) Sample washing position Washing time (s) Reagent standardization SI | Pre-stirring time | 40 sec |
| Initial auto-stability time (s) 5 Initial addition 0.00 Initial stirring 3 Titrant burette 2 Addition type Progressive Addition (ml) 0.25 Limit volume (ml) 10 Polarization value NA End Point value (pH) 8.3 Auto-stability (pH) 0.05 Auto-stability time (s) 1 Max. stability time (s) 60 End titration delay 3 Factor 4.8964 Concentration (mol/l) 1.0 Sample volume (ml) 0.0 Result unit Factor Number decimals 2 Approaching factor 250 Blank (ml) 0.000 Washing type Washing position Washing time (s) 5 Reagent standardization SI | Measurement type | рН |
| Initial addition 0.00 Initial stirring 3 Titrant burette 2 Addition type Progressive Addition (ml) 0.25 Limit volume (ml) 10 Polarization value NA End Point value (pH) 8.3 Auto-stability (pH) 0.05 Auto-stability time (s) 1 Max. stability time (s) 60 End titration delay 3 Factor 4.8964 Concentration (mol/l) 1.0 Sample volume (ml) 0.0 Result unit Factor Number decimals 2 Approaching factor 250 Blank (ml) 0.000 Washing type Washing position Washing time (s) 5 Reagent standardization SI | Initial auto-stability (pH) | 0.02 |
| Initial stirring Titrant burette Addition type Addition (ml) Do.25 Limit volume (ml) Polarization value End Point value (pH) Auto-stability (pH) Auto-stability time (s) End titration delay Factor Concentration (mol/l) Sample volume (ml) Result unit Na Auto-stability time (s) End titration delay Factor Concentration (mol/l) Sample volume (ml) Result unit Factor Number decimals Approaching factor Blank (ml) Washing type Washing position Washing time (s) Reagent standardization SI | Initial auto-stability time (s) | 5 |
| Titrant burette 2 Addition type Progressive Addition (ml) 0.25 Limit volume (ml) 10 Polarization value NA End Point value (pH) 8.3 Auto-stability (pH) 0.05 Auto-stability time (s) 1 Max. stability time (s) 60 End titration delay 3 Factor 4.8964 Concentration (mol/I) 1.0 Sample volume (ml) 0.0 Result unit Factor Number decimals 2 Approaching factor 250 Blank (ml) 0.000 Washing type Washing position Washing time (s) 5 Reagent standardization SI | Initial addition | 0.00 |
| Addition type Addition (ml) O.25 Limit volume (ml) Polarization value End Point value (pH) Auto-stability (pH) Auto-stability time (s) I Max. stability time (s) End titration delay Factor Concentration (mol/l) Sample volume (ml) Result unit Number decimals Approaching factor Blank (ml) Washing type Washing position Washing time (s) Line Value Va | Initial stirring | 3 |
| Addition (ml) Limit volume (ml) Polarization value End Point value (pH) Auto-stability (pH) Auto-stability time (s) End titration delay Factor Concentration (mol/l) Sample volume (ml) Result unit Number decimals Approaching factor Blank (ml) Washing type Washing time (s) 10 0.05 4.8964 4.8964 Concentration (mol/l) 1.0 Result unit Factor Number decimals 2 Approaching factor Blank (ml) Washing type Washing position Washing time (s) Reagent standardization | Titrant burette | 2 |
| Limit volume (ml) Polarization value End Point value (pH) Auto-stability (pH) Auto-stability time (s) I Max. stability time (s) End titration delay Factor Concentration (mol/l) Sample volume (ml) Result unit Number decimals Approaching factor Blank (ml) Washing type Washing position Washing time (s) I O Result unit Factor Vashing time (s) Reagent standardization I O NA B.3 A.3 A.8 A.8 A.8 A.8 A.8 A.8 A | Addition type | Progressive |
| Polarization value End Point value (pH) 8.3 Auto-stability (pH) 0.05 Auto-stability time (s) 1 Max. stability time (s) End titration delay 3 Factor 4.8964 Concentration (mol/I) Sample volume (mI) 0.0 Result unit Factor Number decimals 2 Approaching factor Blank (mI) Washing type Washing position Washing time (s) Reagent standardization | Addition (ml) | 0.25 |
| End Point value (pH) Auto-stability (pH) O.05 Auto-stability time (s) I Max. stability time (s) End titration delay Factor Concentration (mol/l) Sample volume (ml) Result unit Factor Number decimals Approaching factor Blank (ml) Washing type Washing position Washing time (s) Reagent standardization 8.3 4.89 60 End O.000 End titration (mol/l) 1.0 Sample volume (ml) 0.0 0.00 Vashing type Washing position Vashing time (s) SI | Limit volume (ml) | 10 |
| Auto-stability (pH) 0.05 Auto-stability time (s) 1 Max. stability time (s) 60 End titration delay 3 Factor 4.8964 Concentration (mol/l) 1.0 Sample volume (ml) 0.0 Result unit Factor Number decimals 2 Approaching factor 250 Blank (ml) 0.000 Washing type Washing position Washing time (s) 5 Reagent standardization SI | Polarization value | NA |
| Auto-stability time (s) 1 Max. stability time (s) 60 End titration delay 3 Factor 4.8964 Concentration (mol/l) 1.0 Sample volume (ml) 0.0 Result unit Factor Number decimals 2 Approaching factor 250 Blank (ml) 0.000 Washing type Washing position Washing time (s) 5 Reagent standardization SI | End Point value (pH) | 8.3 |
| Max. stability time (s) End titration delay Factor Concentration (mol/l) Sample volume (ml) Result unit Number decimals Approaching factor Blank (ml) Washing type Washing time (s) Reagent standardization Factor 0.00 Washing type Washing toological position Washing time (s) Reagent standardization | Auto-stability (pH) | 0.05 |
| End titration delay Factor 4.8964 Concentration (mol/l) Sample volume (ml) Result unit Number decimals Approaching factor Blank (ml) Washing type Washing time (s) Reagent standardization 4.8964 1.0 2.0 0.0 0.00 Washing type Washing position SI | Auto-stability time (s) | 1 |
| Factor 4.8964 Concentration (mol/l) 1.0 Sample volume (ml) 0.0 Result unit Factor Number decimals 2 Approaching factor 250 Blank (ml) 0.000 Washing type Washing position Washing time (s) 5 Reagent standardization SI | Max. stability time (s) | 60 |
| Concentration (mol/l) Sample volume (ml) Result unit Factor Number decimals Approaching factor Blank (ml) Washing type Washing time (s) Reagent standardization 1.0 2.0 0.00 Washing position SI | End titration delay | 3 |
| Sample volume (ml) Result unit Factor Number decimals Approaching factor Blank (ml) Washing type Washing time (s) Reagent standardization O.00 Washing time (s) SI | Factor | 4.8964 |
| Result unit Number decimals Approaching factor Blank (ml) Washing type Washing time (s) Reagent standardization Factor 250 0.000 Washing position SI | Concentration (mol/l) | 1.0 |
| Number decimals 2 Approaching factor 250 Blank (ml) 0.000 Washing type Washing position Washing time (s) 5 Reagent standardization SI | Sample volume (ml) | 0.0 |
| Approaching factor 250 Blank (ml) 0.000 Washing type Washing position Washing time (s) 5 Reagent standardization SI | Result unit | Factor |
| Blank (ml) Washing type Washing time (s) Reagent standardization O.000 Washing position 5 Reagent SI | Number decimals | 2 |
| Washing type Washing position Washing time (s) 5 Reagent standardization SI | Approaching factor | 250 |
| Washing type Washing position Washing time (s) 5 Reagent standardization SI | | 0.000 |
| Washing time (s) 5 Reagent standardization SI | , , | Washing position |
| Reagent standardization SI | | |
| | | SI |
| | | DEFAULT |

Result in mol/l:

factor x titrant concentration x sample weight / equivalent V dispensed

- An inflection program can be used for standardization instead of a pH 8.3 end point program;
- Some parameters of the program shown here have been compiled as an indication: they can be optimized according to the operating conditions and the samples analyzed, in order to improve the accuracy and/or speed of the analysis.

STEROGLASS Srl shall not be liable for errors or damage due to the negligence of the operator, the failure to read the instructions contained in this manual or for damages caused by the supply, performance or use of this product.

STEROGLASS SrI reserves the right to make changes and/or deletions to this manual without notice.

All rights reserved. The contents of this publication may not be reproduced in any way or used in any form without the written permission of STEROGLASS Srl.