

The wise choice

Volumetric solutions

7321000 rochloric acid, tion 1 mol/I (1 9. Ph Eur, Reag

Schlan 1 moli (1 N), Salzsäur (1 N), Acide chlorhydric 11 moli (1 N), Acido clo 25°C

² BATCH 2247280

Sodium thiosulfate, solution 0,1 mol/l (0,1 N), Reag. Ph Eur Solution 0,1 mol/l (0,1 N), Natriumthiosulfatiosulf 5,1 mol/l (0,1 N), Sodium thiosulfate, solution 0,1 mol/l (0,1 N), Sodio liosolfato.

11

SO07351000

⁰³⁹²BATCH 22473901 Expiry date

AC07441000 1 I Hydrochloric acid, ^{Solution 0,1} mol/I (0,1 N),

7280 Acido diothidrico, 91 mol 10 mol/1 (0,1 N), Salzsäurelösung wedgen 0,1 mol/1 (0,1 N), Salzsäurelösung 10,1 mol/1 (0,1 N), Acide chlorhydrique, 0,1 mol/1 (0,1 N), Acido cloridrico, 25°c

⁰³⁴²BATCH 22466401 Expiry date 2/202 ⁰³⁴⁶ ¹⁰⁸⁰¹ No GHS NO GHS SY

\$1000

trate, 1 0,1 mol/l (0,1 ^{N),} h Eur

11

mol/I (0,1 N), Silbernitratiosu 1 N), Argent nitrate, mol/I (0,1 N), Argento nitrato, 25°C

Scharlau

ATCH 22477301 Exp



Titration is a widely-used analytical technique in determining the concentration of a sample from titrant solutions. It is essential to precisely know the titrant concentration to obtain results as much accurate as possible.

Scharlab has a full range of volumetric solutions manufactured to the highest precision, ensuring a factor of 1.000. These solutions are used as a reference in quantitative analyses, so the confidence interval should be as low as possible. The factor, the uncertainty and the method used to guarantee their precision and quality are detailed in Scharlau Certificates of Analysis. All Scharlau volumetric solutions are tested with an ISO 17034 accredited certified reference material, measured according to ISO/IEC 17025 and traceable to the International System of Units using a NIST Certified Reference Material (SRM®).







Traceability

Scharlau's volumetric solutions are analysed using a certified reference material ISO 17034 accredited, measured according to ISO/IEC 17025 and traceable to the International System of Units by means of a Standard Reference Material from NIST (SRM[®]).

Titre

The titre (or factor) of a volumetric solution is the ratio between the molar concentration obtained (M(x)) and the molar concentration expected (Me(x)).

t = M(x) / Me(x)

Our solutions are manufactured with a titre of 1.000. Because the titre is important for the results of titrations, solution titre should be checked regularly.

Complete Certificate of Analysis

Because volumetric solutions are used as reference materials to calculate the concentration, it is important for the Certificate of Analysis to lists all data characterising the solution.

Our CoA list all the critical data, and is always acompanying the product. On the label, there is a QR code that allows instant access to it using our Scharlab reader app.

Accuracy

To manufacture solutions of accurate concentration, we use modern reactors that allow thorough solution mixing and optimal concentration adjustment to obtain a factor of 1.000.

Expiry date

Ready-to-use volumetric solutions have a shelf life of 3 years, except those with a lower concentration, which have a shelf life of 2 years.

Convenient HPDE bottle

Our 1 litre bottle can be directly used in the automatic titrator. It fits perfectly into the titrator support and does not move, not even when empty.

In addition, raised titration marks allow the user to accurately estimate the amount of liquid remaining in the bottle.

Tailor-made solutions

We can prepare your solutions. Over 50 years of experience in reagent manufacture are your assurance of quality.

SCHARLAU'S VOLUMETRIC SOLUTIONS ARE MANUFACTURED WITH THE UTMOST PRECISION, ALLOWING US TO GUARANTEE

A FACTOR OF **1.000**.

Scharlau

| Volum | netric s | olutions |
|-------|----------|----------|

| | Description | Concentration | Art.No. |
|-----------|------------------------------|--|------------------|
| | Acotic acid | 0.1 mol/l (0.1 N) | AC0364 |
| | Acetic aciu | 1 mol/l (1 N) | AC0365 |
| | | 0.01 mol/l (0.01 N) | AC0757 |
| | | 0.05 mol/l (0.05 N) | AC0754 |
| | | 0.1 mol/I (0.1 N) | AC0746 |
| | | 0.2 mol/l (0.2 N) | AC0740 |
| | | 0.31mol/l (0.31 N) | AC0769 |
| | Hydrochloric acid | 0.5 mol/l (0.5 N) | AC0745 |
| | | 1 mol/l (1 N) | AC0744 |
| | | 2 mol/l (2 N) | AC0748 |
| | | 3 mol/l (3 N) | AC0738 |
| | | 5 mol/l (5 N) | AC0749 |
| | | 6 mol/l (6 N) | AC0752 |
| | | 0.1 mol/l (0.1 N) | AC1611 |
| | Nitric acid | 1 mol/l (1 N) | AC1610 |
| | | 2 mol/l (2 N) | AC1612 |
| | Onno-Phosphone acid | | AC1100 |
| | | 0.025 mol/1 (0.05 N) | AC2000 |
| | | 0.05 mol/l (0.1 N) | AC2082 |
| | | 0.1 mol/l (0.2 N) | AC2087 |
| | | 0.125 mol/l (0.25 N) | AC2088 |
| | | 0.1275 mol/l (0.255 N) | AC2106 |
| | Sulfuric acid | 0.13 mol/l (0.26 N) | AC2084 |
| | | 0.25 mol/l (0.5 N) | AC2081 |
| | | 0.5 mol/l (1 N) | AC2080 |
| ASE | | 1 mol/l (2 N) | AC2085 |
| 08 | | 2.5 mol/l (5 N) | AC2086 |
| | | 4 mol/l (6 N), for COD determination, according ISO 6060 | AC2075 |
| | | 0.1 mol/l (0.1 N) | PO0282 |
| | | 0.23 mol/l (0.23 N), for det. of crude fibre, according Weende | PO0283 |
| | Potassium hydroxide | 0.5 mol/l (0.5 N) | PO0281 |
| | | 1 mol/l (1 N) | PO0280 |
| | | 2 mol/l (2 N) | PO0288 |
| | | 0.05 mol/l (0.1 N) | SO0051 |
| | | 0.5 mol/l (1 N) | SO0050 |
| | | 0.01 mol/l (0.01 N) | SO0439 |
| | | 0.02 mol/l (0.02 N) | SO0448 |
| | | 0.025 mol/1 (0.025 N) | SO0447 SO0453 |
| | | 0.1 mol/l (0.1 N) | SO0443 |
| | | 0.2 mol/l (0.2 N) | SO0445 |
| | | 0.25 mol/l (0.25 N) | SO0444 |
| | | 0.313 mol/l (0.313 N) | SO0474 |
| | | 0.3546 mol/l (0.3546 N) | SO0449 |
| | Sodium hydroxide | 0.4 mol/l (0.4 N) | SO0452 |
| | | 0.5 mol/l (0.5 N) | SO0442 |
| | | 1 mol/l (1 N) | SO0441 |
| | | 1/4.0 mol/1 (1.66 N) | SO0430 SO0464 |
| | | 1/4.9 mol/l (1/4.9 N) | SO0404 SO0465 |
| | | 1/9 mol/1 (1/9 N) | SO0429 |
| | | 2 mol/l (2 N) | SO0440 |
| | | 5 mol/l (5 N) | SO0455 |
| | | 6 mol/l (6 N) | SO0451 |
| | | 1.2 mol/l (1.2 N) | SO0457 |
| | Perchloric acid | 0.1 mol/l (0.1 N) in acetic acid | AC1765 |
| S | | 0.05 mol/l (0.05 N) in acetic acid | AC1766 |
| Ö | Potasium hydroxide | 0.01 mol/l (0.01 N) in 2-propanol | PO0294 |
| RIX N | | 0.05 mol/1 (0.05 N) in 2-propanol | PO0293 |
| AA AAT | | 0.1 mol/l (0.1 N) in 2-propanol | PO0289 |
| NON | | 0.5 mol/l (0.5 N) in methanol | PO0292 |
| | | ethanolic solution 0.1 mol/l | PO0284 |
| | Tetrabutylammonium hydroxide | 0.1 mol/l in 2-propanol/methanol | TE0116 |



| | Description | Concentration | Art. No. |
|-------------|--|--|------------------|
| | | 0.01 mol/l (0.02 N) | AC0971 |
| | | 0.02 mol/l (0.04 N) | AC0973 |
| ž | Ethylenediaminetetraacetic acid, EDTA, disodium salt | 0.025 mol/l (0.05 N) | AC0974 |
| | | 0.05 mol/l (0.1 N) | AC0972 |
| ET | | 0.1 mol/l (0.2 N) | AC0970 |
| NO | Calcium chloride | 1 mol/l | CA0195 |
| Ē | Zing av låsta | 0.05 mol/l | CI0230 |
| ΔP | Zinc sunate | 0.1 mol/l | CI0231 |
| 8 | | 0.02 mol/l | CO0103 |
| | Copper(ii) Suitate | 0.1 mol/l | CO0102 |
| | Magnesium sulfate | 0.01 mol/l | MA0087 |
| | Lead(II) nitrate | 0.05 mol/l | PL0145 |
| | Ovalic acid | 0.005 mol/l (0.01 N) | AC1725 |
| | | 0.05 mol/l (0.1 N) | AC1723 |
| | Amonium iron(III) sulfate, solution | 0.1 mol/l (0.1 N) | HI0317 |
| | Bromide-bromate | 0.05 mol/l (0.1 N), according to ASTM D5776-99 | BR0070 |
| | Cerium(IV) sulfate | 0.05 mol/l (0.05 N) | CE0101 |
| | | 0.1 mol/l (0.1 N) | CE0102 |
| | Potasium bromate | 1/60 mol/l (0.1 N) | PO0165 |
| | | 0.04 mol/l, for COD determination | P00233 |
| | Potasium dichromate | 1/24 mol/l (0.25 N) | P00232 |
| | | 1/6 mol/l (1 N) | P00231 |
| | | 1/60 mol/l (0.1N) | P00230 |
| | Potasium permanganate | 0.02 mol/l (0.1 N) | P00336 |
| × | | 0.2 mol/l (1 N) | P00335 |
| 8 C | Sodium lauryl sulfate | 0.004 mol/l | SO0458 |
| ä | Sodium metaarsenite | 0.05 mol/l (0.1 N) | SO0100 |
| | Sodium nitrate | | S00505 |
| | | 0.002 mol/l (0.002 N) | SOU734 |
| | | 0.05 mol/l (0.05 N) | SOU733 SO0797 |
| | | 0.05 mol/(0.05 N) | SO0737 |
| | Sodium thiosulfate | 0.282 mol/(0.282 N) | SO0731 |
| | | 0.5 mol/l (0.5 N) | SO0732 |
| | | 1 mol// (1 N) | SO0729 |
| | | $\Omega 2 \text{ mol}/I (\Omega 2 \text{ N})$ | SO0736 |
| | | 0.2 mol/l(0.2 N) | Y00025 |
| | | 0.02365 mol/l (0.0473 N) | Y00027 |
| | lodine | 0.05 mol/l (0.1 N) | Y00023 |
| | | 0.5 mol/l (1 N) | YO0024 |
| | Amonium thiocyanate | 0.1 mol/l (0.1 N) | AM0420 |
| | Hyamine [®] 1622 | 0.004 mol/l | HY0001 |
| | (Hyamine® is a tradémark of Rohm and Haas company) | | 110001 |
| NO | Mercury(II) nitrate | 0.01 mol/l (0.02 N) | ME0197 |
| TAT | Silver nitrate | 0.01 mol/l (0.01 N) | PL0058 |
| LIA | | 0.02 mol/1 (0.02 N) | PL0056 |
| U E E | | | PL0059 |
| Ë | | 0.1 mol/1 (0.1 N) | PL0055 |
| | Datasi um thissu anata | $\frac{1}{1} \frac{1}{1} \frac{1}$ | PL0037 |
| | Foldsium chlorida | | P00375 |
| | | | 300229 |
| (5 | Bottles | 500 ml | |
| Ň | | | |
| KAC | Jerricans | 51 | |
| PACI | Kubitainer | 10 | |
| | | | |



Volumetric solutions according to Pharmacopoeia

The pharmaceutical industry requires that the titrated solutions which are used in the quality control of its raw materials and its finished products, follow the requirements set out by the corresponding pharmacopoeias. The volumetric solutions used in the analyses of the pharmacopoeia monographs must comply with the specifications indicated in the "Reagents" section of the European Pharmacopoeia (Ph. Eur), or in the "Reagents, Indicators and Solutions" chapter of the United States Pharmacopoeia (USP).

The European and United States pharmacopoeias (Ph. Eur and USP, respectively) are the most recognised and followed worldwide. They contain the minimum quality standards required for products to be used in the pharmaceutical industry. Scharlau's volumetric solutions according to pharmacopoeia contain the mention "Reag. Ph. Eur" or "Reag. USP" in their description, depending on which pharmacopoeia they follow.

Despite not being a requirement of the pharmacopoeia itself, Scharlau's volumetric solutions according to pharmacopoeia are adjusted to a factor of 0.999-1.001. The uncertainty value of our pharmacopoeia-assessed solutions is calculated to never exceed the value of ± 0.002 in all cases, with a confidence level of 95% (k=2), thus ensuring maximum precision in concentration values reported in the Certificate of Analysis.

Packaging

Our pharmacopoeia volumetric solutions are available in 1 litre HDPE bottles. These bottles can be directly connected to an automatic titrator, as they fit perfectly on the equipment support and do not move, even when empty. Additionally, it has raised markings enabling the user to accurately estimate the amount of liquid remaining in the bottle.



| Description | Application | Packaging | Art. No. |
|---|-----------------------|-----------|------------|
| Ammonium thiocyanate, solution 0.1 mol/I (0.1 N), Reag. Ph Eur, Reag. USP | Precipitation | 11 | AM04221000 |
| Cerium(IV) sulfate, solution 0.1 mol/I (0.1 N), Reag. Ph Eur | Redox | 11 | CE01041000 |
| Hydrochloric acid, solution 0.1 mol/l (0.1 N), Reag. Ph Eur, Reag. USP | Acid/Base | 11 | AC07311000 |
| Hydrochloric acid, solution 1 mol/l (1 N), Reag. Ph Eur, Reag. USP | Acid/Base | 11 | AC07321000 |
| lodine, solution 0.05 mol/l (0.1 N), Reag. Ph Eur, ChP | Redox | 11 | YO00261000 |
| Perchloric acid, solution in acetic acid 0.1 mol/l (0.1 N), Reag. Ph Eur, Reag. USP | Non-aqueous matrix | 11 | AC17641000 |
| Potassium hydroxide, solution 0.1 mol/l (0.1 N), Reag. Ph Eur | Acid/Base | 11 | PO02951000 |
| Potassium hydroxide, solution 1 mol/l (1 N), Reag. USP | Acid/Base | 11 | PO02961000 |
| Potassium permanganate, solution 0.02 mol/l (0.1 N), Reag. Ph Eur | Redox | 11 | PO03411000 |
| Silver nitrate, solution 0.1 mol/l (0.1 N), Reag. Ph Eur, ChP | Precipitation | 11 | PL00541000 |
| Sodium hydroxide, solution 0.1 mol/l (0.1 N), Reag. Ph Eur, Reag. USP, ChP | Acid/Base | 11 | SO04591000 |
| Sodium hydroxide, solution 1 mol/l (1 N), Reag. Ph Eur, Reag. USP | Acid/Base | 11 | SO04541000 |
| Sodium thiosulfate, solution 0.1 mol/l (0.1 N), Reag. Ph Eur | Redox | 11 | SO07351000 |
| Sulfuric acid, solution 0.5 mol/l (1 N), Reag. Ph Eur, Reag. USP | Acid/Base | 11 | AC20981000 |
| Zinc sulfate, solution 0.1 mol/I, Reag. Ph Eur, ChP | Complexometry | 11 | CI02321000 |



Secondary standards

The Titrasure[®] range of secondary standards for volumetric titrations includes various reference materials used for comparative purposes when calibrating and verifying different volumetric instruments and measurement techniques.

These secondary standards are designed with the ideal purity and accuracy necessary for their specific application in volumetric titrations. They have an uncertainty of $\pm 0.05\%$ and are traceable to NIST. All these specifications are indicated on the CoA.

Their main role is to guarantee precise, consistent volumetric measurements and, therefore, confirm the reliability of the results obtained in analytical and laboratory processes.



| Description | Packaging | Art. No. |
|--|-----------|------------|
| Benzoic acid, secondary standard for volumetric titrations, Titrasure® | 80 g | AC05660080 |
| Calcium carbonate, secondary standard for volumetric titrations, Titrasure® | 60 g | CA01850060 |
| Zinc, secondary standard for volumetric titrations, Titrasure® | 100 g | CI01470100 |
| Disodium oxalate, secondary standard for volumetric titrations, Titrasure® | 80 g | SO05310080 |
| Iron (II) ethylenediammonium sulphate tetrahydrate, secondary standard for volumetric titrations, Titrasure® | 80 g | HI03700080 |
| Potassium biphthalate, secondary standard for volumetric titrations, Titrasure® | 100 g | PO01310100 |
| Potassium chloride, secondary standard for volumetric titrations, Titrasure® | 100 g | PO02070100 |
| Potassium dichromate, secondary standard for volumetric titrations, Titrasure® | 100 g | PO02350100 |
| Potassium iodide, secondary standard for volumetric titrations, Titrasure® | 100 g | PO04040100 |
| Sodium chloride, secondary standard for volumetric titrations, Titrasure® | 100 g | SO02340100 |
| Tris-(hydroxymethyl)-aminomethane, secondary standard for volumetric titrations, Titrasure® | 80 g | TR04270080 |

Scharlab S.L.

Gato Pérez, 33. Pol. Ind. Mas d'en Cisa. 08181 Sentmenat, Barcelona, Spain Tel.: +34 93 745 64 00 - Fax: +34 93 715 27 65 E-mail: consultas@scharlab.com

Scharlab Italia S.r.l.

Via Massimo D'Azeglio 20 26900 LODI (LO) Tel.: +39 02 9823 0679 E-mail: customerservice@scharlab.it

Scharlab Philippines, Inc.

4/F Unit K, No. 35 Sto. Niño Street cor. Fernando Poe Jr. Ave. Barangay San Antonio, Quezon City 1105 Philippines Landline: +63 2 8671 9674 E-mail: infophilippines@scharlab.ph



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