



Volumetric Solutions

Traceable to SRM of NIST

Concentrated Volumetric Solutions

Other reagents for
Volumetry

PanReac 
AppliChem
ITW Reagents

Volumetric Solutions

Traceable to SRM of NIST

Titration is one of the most common techniques used in analytical laboratories to determine the concentration of a dissolved substance. For this application, we offer a large range of volumetric solutions ready to use, subject to stringent manufacturing and testing requirements. We select the appropriate raw materials and packaging to assure the highest purity and quality. They are traceable to SRM of NIST and the factor of the volumetric solutions is adjusted to f: 1.000 with a tolerance of $\pm 0.1\%$. Our program also includes concentrated volumetric solutions, indicators and standards.



Product	Concentration	Application / According to	Code	Package						
				500 ml	1 L	2.5 L	5 L	10 L	25 L	
Acetic Acid	1 M		181009		P					
Ammonium Iron (II) Sulfate	0.1 M	for determination of COD	181369		P		P			
Ammonium Thiocyanate	0.1 M	Reag. USP, Reag. Ph. Eur.	181144		P					
Benzethonium Chloride	0.004 M	for titration of anionic surfactants	183141		P					
Bromine (Bromate-Bromide)	0.05 M (0.1N)		182000		P					
Cerium(IV) Sulfate	0.1 M	Reag. USP	181249		P	P				
Copper(II) Sulfate	0.1 M		181271		P					
EDTA Disodium Salt	0.01 M		181671		P	P				
	0.01783 M	for determination of water hardness in german degrees	187087		P					
	0.05 M		182120		P		P			
	0.1 M		181670		P		P			
Hydrochloric Acid	0.01 M		182884		P					
	0.02 M		183458		P					
	0.05 M		182107		P					
	0.1 M		181023		P	P	P		P	
	0.25 M		182318		P					
	0.310 M (1.128% w/v)	for determination of starch in feed (Ewers)	185423		P		P			
	0.5 M		181022		P		P		P	
	1 M		181021		P		P		P	P
	1 M	Reag. Ph. Eur.	186985		P					
	2 M		182108		P					P
	3 M	for analysis of raw fat	182057		P				P	
	4 M		182552		P		P			
	5 M		182109		P		P		P	
	6 M		182883		P					
10 M		187051		P						
Iodine	0.01 M (0.02N)		181969		P	P				
	0.02365 M (0.0473N)	for determination of iodine adsorption number (ASTM D 1510)	182915				P			
	0.025 M (0.05N)	Reag. USP	182161		P					
	0.05 M (0.1N)	Reag. USP, Reag. Ph. Eur.	181772		P	P				
	0.5 M (1N)		182162		P					

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Product	Concentration	Application / According to	Code	Package						
				500 ml	1 L	2.5 L	5 L	10 L	25 L	
Iodine (Iodate-Iodide)	N/50		185733							
	N/64		186880							
Lanthanum(III) Nitrate	0.1 M		187042							
Magnesium Sulfate	0.01 M		187098							
Mercury(II) Nitrate	0.05 M (0.1N)		181424							
Nitric Acid	0.1 M		181040							
	1 M		181039							
	2 M		182112							
Oxalic Acid	0.05 M (0.1N)	Reag. USP	181043							
	0.5 M (1N)		181042							
Perchloric Acid	0.1 M in acetic acid	Reag. USP, Reag. Ph. Eur.	181046							
	0.1 M in 1,4-dioxan	Reag. USP	181047							
Potassium Bromate	1/60 M (0.1N)	Reag. USP	181488							
Potassium Dichromate	1/60 M (0.1N)	Reag. USP, Reag. Ph. Eur.	181502							
	1/24 M (0.25N)		182142							
	1/6 M (1N)		181501							
Potassium Dichromate with 80 g/l of Mercury(II) Sulfate	0.04 M	for determination of COD (NFT 90-101)	184385							
Potassium Hydroxide	0.1 M		181521							
	0.1 M in ethanol	Reag. USP, Reag. Ph. Eur.	182146							
	0.1 M in methanol		182147							
	0.1 M in 2-propanol		183336							
	0.23 M	for determination of raw fibre	183354							
	0.5 M		181518							
	0.5 M in ethanol	Reag. USP, Reag. Ph. Eur.	181519							
	0.5 M in methanol		181520							
1 M		181517								
Potassium Iodide	1 M		182256							
	2 M (pH 7.0)		183425							
Potassium Permanganate	0.002 M (0.01N)		181790							
	0.02 M (0.1N)	Reag. USP	181529							
	0.02 M (0.1N)	Reag. Ph. Eur.	186986							
	0.1 M (0.5N)	for the titration of percarbonates	182651							
	0.2 M (1N)		181528							
Potassium Thiocyanate	0.1 M	Reag. USP	181535							
SDS	0.004 M	for the titration of cationic surfactants	182792							
Silver Nitrate	0.01 M		182564							
	0.02 M		181465							
	0.05 M		182115							
	0.1 M		181464							
	0.1 M	Reag. USP	186983							
	0.5 M		185560							
	1 M		182116							
Sodium Carbonate	0.5 M (1N)		181649							

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Product	Concentration	Application / According to	Code	Package								
				100 ml	250 ml	500 ml	1 L	2.5 L	5 L	10 L	25 L	
Sodium Hydroxide	0.01 M		181845									
	0.02 M		183397									
	0.05 M		182153									
	0.1 M (bromophenol blue)		181693									
	0.1 M (phenolphthalein)		181694									
	0.1 M in ethanol		182284									
	0.111 M	for analysis of acidity in milk (Dornic)	183154									
	0.2 M		182971									
	0.25 M		182155									
	0.313 M	for determination of raw fibre	183337									
	0.3546 M (N/2.82)	for analysis of oils	182156									
	0.5 M		181692									
	1 M (bromophenol blue)		181691									
	1 M (phenolphthalein)	Reag. USP	182415									
	1 M (phenolphthalein)	Reag. Ph. Eur.	186982									
	1.02 M		185528									
	2 M		182158									
	4 M		183466									
	5 M		182159									
8 M		187063										
10 M		183508										
Sodium Tetrphenylborate	0.01 M		187057									
Sodium Thiosulfate	0.01 M		182577									
	0.0394 M	for determination of iodine adsorption number (ASTM D 1510)	182914									
	0.05 M		182160									
	0.1 M	Reag. USP	181723									
	0.1 M	Reag. Ph. Eur.	186987									
	0.2 M		183489									
	1 M		181722									
Sulfuric Acid	0.01 M (0.02N)		182102									
	0.025 M (0.05N)		182103									
	0.05 M (0.1N)		181061									
	0.1 M (0.2N)		182011									
	0.1275 M (0.255N)	for determination of raw fibre	183335									
	0.25 M (0.5N)		181060									
	0.5 M (1N)		181059									
	0.9 M (1.8N)		185775									
	1 M (2N)		182105									
	2 M (4N)		183426									
	2.5 M (5N)		182106									
	4 M (8N)	for determination of COD (ISO 6060, NFT 90-101)	185314									
Tetrabutylammonium Hydroxide	0.1 M in 2-propanol/methanol 11:1		183669									
	0.1 M in toluene/methanol 9:1		185225									
	1 M in methanol		187139									
Zinc Sulfate	0.05 M		182163									
	0.1 M		181789									

Packaging symbols: Glass bottle Polyethylene bottle Polyethylene canister Sol-Pack: Polyethylene container in a carton box (cubiteiner), with tap

Concentrated Volumetric Solutions

Stable, accurate and long lasting solutions

We offer concentrated solutions for the preparation by dilution of volumetric solutions. With PanReac AppliChem Concentrated Volumetric Solutions you will save storage space. They are very stable and have very long conservation (5 years). Quick and easy to make, just dilute with the desired solvent.

You can prepare concentrations other than those specified on the label. If the solution has been diluted under optimal conditions, we guarantee the concentration with $\pm 0.2\%$ accuracy. The plastic ampoules are offered inside an anti-shock blister and the glass ones are delivered inside a polystyrene protective shell. All topics concerning the usage and the safety are notified in the packaging. Each ampoule includes a sticker for a perfect identification of the prepared solution.



Code	Description	Package: 1 ampoule
303118	EDTA Disodium Salt 0.1 mol (37.224g $C_{10}H_{14}N_2Na_2O_8 \cdot 2H_2O$) to prepare 1l of 0.1M solution	
303110	Hydrochloric Acid 0.1 mol (3.646g HCl) to prepare 1l of 0.1N solution	
303112	Hydrochloric Acid 1 mol (36.461g HCl) to prepare 1l of 1N solution	
303119	Iodine 0.05 mol (12.690g I_2) to prepare 1l of 0.1N solution	
303124	Potassium Permanganate 0.02 mol (3.161g $KMnO_4$) to prepare 1l of 0.1N solution	
303117	Silver Nitrate 0.1 mol (16.987g $AgNO_3$) to prepare 1l of 0.1N solution	
303125	Sodium Hydroxide 0.1 mol (4.000g NaOH) to prepare 1l of 0.1N solution	
303126	Sodium Hydroxide 1 mol (40.00g NaOH) to prepare 1l of 1N solution	
303127	Sodium Thiosulfate 0.1 mol (24.818g $Na_2S_2O_3 \cdot 5H_2O$) to prepare 1l of 0.1N solution	
303114	Sulfuric Acid 0.05 mol (4.904g H_2SO_4) to prepare 1l of 0.1N solution	

Titration Indicators

For end-point detection by colour change

Indicators are used with volumetric solutions to show the end-point of the titration through visual colour change.

Our program includes both indicators in powder form and ready-to-use solutions

Indicator	Code	Package										
		1 g	5 g	10 g	25 g	50 g	100 g/ml	250 g/ml	500 g/ml	1 kg/L	2.5 L	
Alizarin Red S (C.I. 58005)	121605				☞							
Alum Iron Ammonium saturated solution	281366							☞				
Bromocresol Green, ACS	131759		☞		☞							
Bromocresol Green solution 0.04%	281760						☞					
Bromocresol Purple	121546				☞							
Bromophenol Blue, ACS	131165		☞		☞							
Bromophenol Blue solution 0.04%	281166						☞					
Bromothymol Blue, ACS	131167		☞		☞							
Bromothymol Blue solution 0.04%	281168						☞					
Calconcarboxylic Acid (Reag. Ph. Eur.)	123575				☞							
Crystal Violet (C.I. 42555), ACS	131762						☞					
2',7'-Dichlorofluorescein (Reag. Ph. Eur.), ACS	133606		☞									
2,6-Dichlorophenol Indophenol Sodium Salt 2-hydrate (Reag. Ph. Eur.), ACS	132056		☞									
Dimidium Bromide (Reag. Ph. Eur.)	122844	☞										
Diphenylamine (Reag. Ph. Eur.), ACS	131828						☞					
1,5-Diphenylcarbazide	123577				☞							
Eosin Yellowish (C.I. 45380), ACS	131299				☞							
Eriochrome Black T (C.I. 14645), ACS	131439				☞		☞				☞	
Eriochrome Black T solution 1%	281440						☞					
Ferroin solution 0.025 mol/l (0.025M)	283462						☞					
Fluorescein Sodium (C.I. 45350)	122389						☞		☞	☞		
Indicator 4.4, Mixed (Methyl Red-Methylene Blue)	282430							☞				
Indicator 4.8, Mixed (Methyl Red-Bromocresol Green)	283303							☞				
Indicator, Mixed (Dimidium Bromide-Disulfine Blue)	286330											☞
Indicator Buffer Tablets	285406						☞					
Methyl Orange (C.I. 13025), ACS	131431				☞		☞					
Methyl Orange solution 0.04%	281433							☞				
Methyl Orange solution 0.1%	281432						☞	☞				
Methyl Red (C.I. 13020), ACS	131617			☞	☞		☞					
Methyl Red solution 0.1%	281618						☞					
Murexide (C.I. 56085) (Reag. Ph. Eur.), ACS	131436		☞									
Murexide 1% in Sodium Chloride	281437						☞					
1,10-Phenanthroline 1-hydrate, ACS	131321		☞		☞							
Phenol Red, ACS	131615		☞				☞					
Phenolphthalein (Reag. Ph. Eur.), ACS	131325						☞		☞			
Phenolphthalein solution 0.1%	283090						☞					
Phenolphthalein solution 0.2%	281326						☞					
Phenolphthalein solution 1%	281327							☞		☞		
Phenolphthalein solution 2%	172866								☞		☞	☞
Potassium Chromate (max. 0.02% Na) (Reag. Ph. Eur.), ACS	131497							☞		☞	☞	
Potassium Chromate pure	141497								☞	☞	☞	
Potassium Chromate solution 10% w/v	281499							☞				
Potassium Chromate solution 5% w/v	281498							☞				
Resazurin Sodium Salt	121591		☞									
Starch from Potato soluble (Reag. USP, Reag. Ph. Eur.)	121096								☞	☞		
Starch solution 1%	283146						☞	☞		☞		
5-Sulfosalicylic Acid 2-hydrate (Reag. Ph. Eur.)	122838							☞		☞		
Thymolphthalein, ACS	131739		☞									
Thymolphthalein solution 0.1%	281740										☞	
Universal Indicator of pH, solution	281370						☞					
Xylenol Orange Tetrasodium Salt, ACS	132617		☞									

Volumetric analysis indicators can be categorized based on the type of reaction involved in the process:













- pH Indicators for titrations in aqueous media
- Acid-Base Indicators in non-aqueous media
- Redox Indicators
- Adsorption Indicators
- Complexometric Indicators
- Titration of Surfactants
- Titration of Chlorides



Type of indicator							
pH aqueous	Acid-Base non-aqueous	Redox	Adsorption	Complexom.	Titration of Surfactants	Titration of Chlorides	Transition interval
✓			✓				pH 3.7 – 5.2 yellow – purple red
						✓	
✓							pH 3.8 – 5.4 yellow – blue
✓							pH 3.8 – 5.4 yellow – blue
✓			✓				pH 5.2 – 6.8 greenish yellow – bluish purple
✓			✓				pH 3.0 – 4.6 greenish yellow – blue
✓			✓				pH 3.0 – 4.6 greenish yellow – blue
✓							pH 6.0 – 7.6 yellow – blue
✓							pH 6.0 – 7.6 yellow – blue
				✓			
	✓		✓				
		✓					
		✓					
		✓	✓				
		✓	✓				
		✓	✓				
		✓					
✓			✓				pH 4.4 – 5.8 red violet – green
✓							pH 4.8 – 5.5 pink violet – emerald green
					✓		pale pink – pale blue
				✓			
✓		✓					pH 3.2 – 4.4 red – yellow
✓		✓					pH 3.2 – 4.4 red – yellow
✓		✓					pH 3.2 – 4.4 red – yellow
✓		✓					pH 4.2 – 6.2 red – yellow
✓		✓					pH 4.2 – 6.2 red – yellow
				✓			
				✓			
		✓					
✓							pH 6.8 – 8.2 yellow – red
✓							pH 8.0 – 10.0 colourless – red-violet
✓							pH 8.0 – 10.0 colourless – red-violet
✓							pH 8.0 – 10.0 colourless – red-violet
✓							pH 8.0 – 10.0 colourless – red-violet
✓							pH 8.0 – 10.0 colourless – red-violet
						✓	
						✓	
						✓	
✓		✓					pH 5.0 – 7.0 pink – blue violet
		✓					
		✓					
✓				✓			
✓	✓						pH 9.3 – 10.5 colourless – blue
✓	✓						pH 9.3 – 10.5 colourless – blue
✓							Color range: pH 1 red sherry; pH 2 pink; pH 3 red orange; pH 4 orange red; pH 5 orange; pH 6 yellow; pH 7 yellow green; pH 8 green; pH 9 green bluish; pH 10 blue
				✓			


Volumetric standards


To check the factor of the volumetric solutions, we supply Standards for Volumetry, our range of reference materials with a high purity of $100 \pm 0.05\%$ after drying. Available in 100-g glass bottles and some of them in boxes of 10 individually sealed glass tubes containing 1.5 g each of the ready-to-use product. As using the 100-g bottles exposes the product to air each time the bottle is opened, we also provide suitable methods for drying the product. Each standard comes with its corresponding certificate of analysis indicating its purity and tolerance, the method used to determine this value, the NIST reference standard and the expiry date. In the following table you will find information about the available standards and the suitable method for drying the product if necessary.

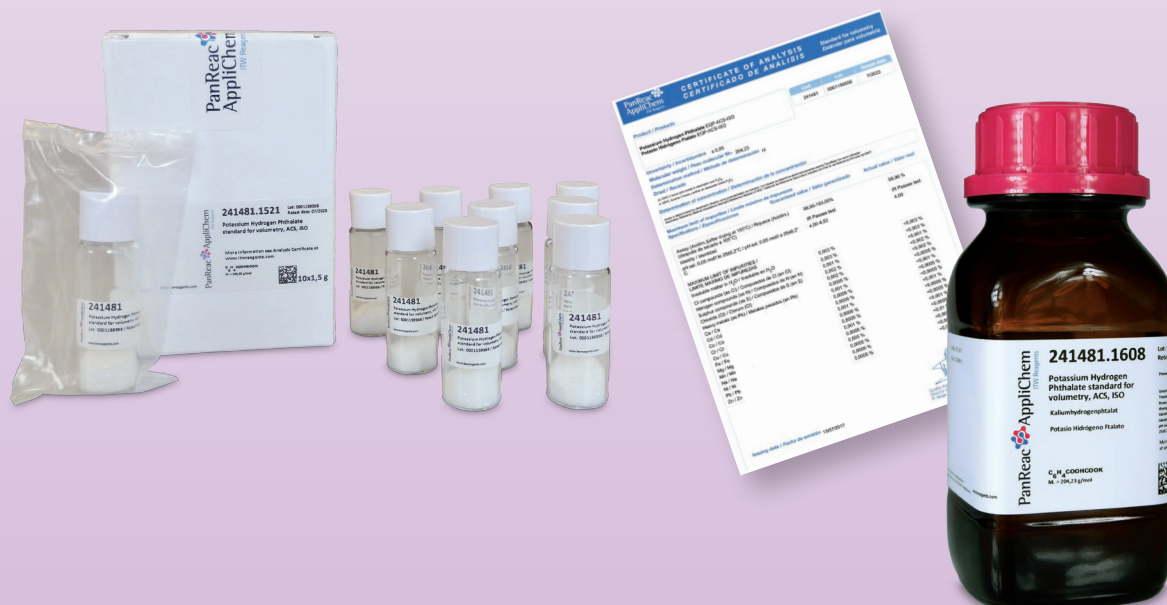
Substance	Type of titration						Drying method	Code	Package	
	Acidimetry	Alkalimetry	Argentometry	Redox	Iodometry	Karl Fischer			10x1.5 g	100 g
Benzoic Acid		✓					over silica gel	241014		
Potassium Bromate				✓			130°C *	241487		
Potassium Dichromate				✓			130°C *	241500		
Potassium Hydrogen Phthalate		✓					105°C *	241481		
Potassium Iodate					✓		130°C *	241540		
Sodium Carbonate anhydrous	✓						120°C *	241648		
Sodium Chloride			✓				110°C *	241659		
di-Sodium Oxalate				✓			130°C *	241706		
Sodium Tartrate 2-hydrate						✓	110°C *	241719		
Tris (Hydroxymethyl) Aminomethane	✓						105°C *	241940		

* Dry in an oven at the specified temperature for 2 hours and allow to cool in a desiccator before use

Packaging symbols:

 Glass bottle

 Glass tube with stopper and screw top



Other reagents used in Volumetric analysis

Description	Application	Code	Package							
			250 ml	500 ml	1 L	2.5 L	5 L	10 L	25 L	30 L
Acidimetric Liquor titrated	for determination of acidity in milk. 1 ml corresponds to 0.01g of lactic acid (=1° Dornic)	281384								
Acidimetric Liquor titrated	for determination of oils and fats acidity in commercial grades. For 10 g of oil, 1 ml corresponds to 1° of acidity (=0.1 g of oleic acid)	281381								
Acidimetric Liquor titrated	for determination of oils and fats acidity. 1 ml corresponds to 0.028245 g of oleic acid	281380								
Ammonia Fixative solution 1%	for Kjeldahl nitrogen determination	283334								
Boric Acid solution 1%	for Kjeldahl nitrogen determination	282972								
Boric Acid solution 2%	for Kjeldahl nitrogen determination	287096								
Boric Acid solution 3%	for Kjeldahl nitrogen determination	282928								
Boric Acid solution 4%	for Kjeldahl nitrogen determination	282222								
Buffer Solution pH 10	for complexometry	281730								
Complexon-Magnesium 0.1 mol/l	for complexometry	281280								
Hanus Reagent 0.1 mol/l (0.2N)	for determination of iodine index	281572								
Indicator Solvent 1 for acidity determination in olive oil	Mixture of Ethanol, Diethyl Ether and Phenolphthalein (0.0015%)	281298								
Indicator Solvent 2 for acidity determination in olive oil	Mixture of Ethanol, Diethyl Ether and Phenolphthalein (0.1%)	285483								
Indicator Solvent 3 for acidity determination in olive oil	Mixture of Ethanol, Diethyl Ether and Bromophenol Blue (0.2%)	285482								
Lithium Chloride 1 mol/l in ethanol	Electrolyte for non-aqueous media	285250								
Potassium Chloride 3 mol/l + Silver Chloride	for potentiometric electrodes	282923								
Potassium Chloride 3 mol/l	for potentiometric electrodes	282775								
Potassium Chloride saturated solution	for potentiometric electrodes	281495								
Potassium Dichromate 0.005 mol/l with 20 g/l of Mercury(II) Sulfate	for determination of COD	177074								
Potassium Iodide solution 10% w/v	for iodometric titrations	171543								
Silver Sulfate solution 10 g/l in sulfuric acid	for determination of COD	283098								
Silver Sulfate solution 6.6 g/l in sulfuric acid	for determination of COD	282922								
Sulfuric Acid 0.13 mol/l (0.26N)	for determination of raw fibre according to ISO 6865:2000	176191								
Wijs' Reagent 0.1 mol/l (0.2N)	for determination of iodine index	281590								
Zeleny's Reagent	for determination of the sedimentation value in wheat	286079								

Packaging symbols: Aluminium bottle Glass bottle Polyethylene bottle Polyethylene canister Stainless steel drum (returnable)



A181,EN;201707

PanReac 
AppliChem
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