Wako

Reagents for Analytical Chemistry

2013

INDEX

Description	Grade	Note	Pkg. Size	Wako Cat. No.	

A. Reagents for Titration

1. Prepared Reagents for Volumetric Analysis (Normal Solution)

<Acetic Acid>

1 mol/L Acetic Acid (1N)

	for Volumetric Analysis		500 mL	013-18845

0.1 mol/L Acetic Acid (N/10)

	for Volumetric Analysis		500 mL	016-18835

<Ammonium Thiocyanate>

0.1 mol/L Ammonium Thiocyanate Solution (N/10)

	for Volumetric Analysis		500 mL	019-03555

<Bromine>

0.05 mol/L Bromine Solution

	for Volumetric Analysis		500 mL	022-14455

<EDTA>

0.2 mol/L Disodium Dihydrogen Ethylenediamine Tetraacetate Solution

	for Volumetric Analysis		500 mL	051-06995

0.025 mol/L Disodium Dihydrogen Ethylenediamine Tetraacetate Solution

	for Volumetric Analysis		500 mL	058-07005

<Hydrochloric Acid>

6 mol/L Hydrochloric Acid

	for Volumetric Analysis		100 mL	082-05421
			500 mL	084-05425

5 mol/L Hydrochloric Acid

	for Volumetric Analysis		500 mL	081-05435

2 mol/L Hydrochloric Acid

	for Volumetric Analysis		100 mL	081-02711
			500 mL	083-02715

1 mol/L Hydrochloric Acid

	for Volumetric Analysis		100 mL	081-01091
			500 mL	083-01095
			3 L	087-01093 *1
	for Volumetric Analysis (Standardized by General Tests of the JP		500 mL	080-08065

0.5 mol/L Hydrochloric Acid

	for Volumetric Analysis		100 mL	084-01101
			500 mL	086-01105

0.2 mol/L Hydrochloric Acid

	for Volumetric Analysis		500 mL	080-02725

0.1 mol/L Hydrochloric Acid

	for Volumetric Analysis		100 mL	081-01111
			500 mL	083-01115
			3 L	087-01113 *1
	for Volumetric Analysis (Standardized by General Tests of the JP		500 mL	087-08075

0.05 mol/L Hydrochloric Acid

	for Volumetric Analysis		500 mL	087-02735

0.02 mol/L Hydrochloric Acid

	for Volumetric Analysis		500 mL	084-02745

0.01 mol/L Hydrochloric Acid

	for Volumetric Analysis		500 mL	088-02265

0.5 mol/L Hydrochloric Acid Methanolic Solution

	for Volumetric Analysis		500 mL	080-07725

<Iodine>

0.5 mol/L Iodine Solution

	for Volumetric Analysis		500 mL	094-01705

0.05 mol/L Iodine Solution

	for Volumetric Analysis		100 mL	099-00471

0.05 mol/L Iodine Solution

	for Volumetric Analysis		500 mL	091-00475

0.01 mol/L Iodine Solution

	for Volumetric Analysis		500 mL	094-03145

<Magnesium Chloride>

0.05 mol/L Magnesium Chloride Solution

	for Volumetric Analysis		500 mL	135-14215

Description	Grade	Note	Pkg. Size	Wako Cat. No.
<Nitric Acid>				
1 mol/L Nitric Acid (1N)				
	for Volumetric Analysis		500 mL	148-03515
0.1 mol/L Nitric Acid (N/10)				
	for Volumetric Analysis		500 mL	141-01425
<Oxalic Acid>				
0.5 mol/L Oxalic Acid Solution				
	for Volumetric Analysis		500 mL	157-00465
0.05 mol/L Oxalic Acid Solution				
	for Volumetric Analysis		500 mL	154-00475
0.0125 mol/L Oxalic Acid Solution				
	for Volumetric Analysis		500 mL	153-02405
<Potassium Bromate>				
1/60 mol/L Potassium Bromate Solution				
	for Volumetric Analysis		500 mL	163-20765
<Potassium Dichromate>				
1/6 mol/L Potassium Dichromate Solution (1N)				
	for Volumetric Analysis		500 mL	162-07035
1/24 mol/L Potassium Dichromate Solution (N/4)				
	for Volumetric Analysis		500 mL	169-14015
1/30 mol/L Potassium Dichromate Solution (N/5)				
	for Volumetric Analysis		500 mL	166-14025
1/60 mol/L Potassium Dichromate Solution (N/10)				
	for Volumetric Analysis		500 mL	160-03675
<Potassium Hydroxide>				
8 mol/L Potassium Hydroxide Solution (8N)				
	for Volumetric Analysis		500 mL	169-20365
1 mol/L Potassium Hydroxide Solution (1N)				
	for Volumetric Analysis		500 mL	169-03885
0.5 mol/L Potassium Hydroxide Solution (N/2)				
	for Volumetric Analysis		500 mL	166-03895
0.1 mol/L Potassium Hydroxide Solution (N/10)				
	for Volumetric Analysis		500 mL	169-03905
0.5 mol/L Potassium Hydroxide Ethanolic Solution (N/2)				
	for Volumetric Analysis		500 mL	166-07055
0.1 mol/L Potassium Hydroxide Ethanolic Solution (N/10)				
	for Volumetric Analysis		500 mL	166-03915
0.05 mol/L Potassium Hydroxide Ethanolic Solution (N/20)				
	for Volumetric Analysis		500 mL	160-07075
0.1 mol/L Potassium Hydroxide 2-Propanolic Solution (N/10)				
	for Volumetric Analysis		500 mL	163-03925
<Potassium Iodate>				
0.05 mol/L Potassium Iodate Solution				
	for Volumetric Analysis		500 mL	161-20825
1/60 mol/L Potassium Iodate Solution (N/10)				
	for Volumetric Analysis		500 mL	162-20355
1/240 mol/L Potassium Iodate Solution (N/40)				
	for Volumetric Analysis		500 mL	168-20835
<Potassium Permanganate>				
0.2 mol/L Potassium Permanganate Solution (1N)				
	for Volumetric Analysis		500 mL	167-07085
0.1 mol/L Potassium Permanganate Solution (N/2)				
	for Volumetric Analysis		500 mL	164-07095
0.04 mol/L Potassium Permanganate Solution (N/5)				
	for Volumetric Analysis		500 mL	167-07105
0.02 mol/L Potassium Permanganate Solution (N/10)				
	for Volumetric Analysis		500 mL	168-04215
	for Volumetric Analysis (Standardized by General Tests of the JP		500 mL	162-21195
0.005 mol/L Potassium Permanganate Solution (N/40)				
	for Volumetric Analysis		500 mL 3 L	161-08225 169-08221
0.002 mol/L Potassium Permanganate Solution (N/100)				
	for Volumetric Analysis		500 mL	164-14185

Description	Grade	Note	Pkg. Size	Wako Cat. No.	
0.1 mol/L Potassium Thiocyanate Solution (N/10)					
	for Volumetric Analysis		500 mL	164-07115	

<Silver Nitrate>

1 mol/L Silver Nitrate Solution (1N)					
	for Volumetric Analysis		500 mL	198-05335	
0.1 mol/L Silver Nitrate Solution (N/10)					
	for Volumetric Analysis		100 mL	190-00851	
			500 mL	192-00855	
0.02 mol/L Silver Nitrate Solution (N/50)					
	for Volumetric Analysis		500 mL	196-09535	
0.01 mol/L Silver Nitrate Solution (N/100)					
	for Volumetric Analysis		500 mL	191-05185	

<Sodium Carbonate>

0.5 mol/L Sodium Carbonate Solution (1N)					
	for Volumetric Analysis		500 mL	199-05365	
0.25 mol/L Sodium Carbonate Solution (N/2)					
	for Volumetric Analysis		500 mL	194-12525	
0.05 mol/L Sodium Carbonate Solution (N/10)					
	for Volumetric Analysis		500 mL	193-01625	

<Sodium Chloride>

1 mol/L Sodium Chloride Solution (1N)					
	for Volumetric Analysis		500 mL	192-05355	
0.1 mol/L Sodium Chloride Solution (N/10)					
	for Volumetric Analysis		500 mL	195-01685	
0.05 mol/L Sodium Chloride Solution (N/20)					
	for Volumetric Analysis		500 mL	195-05345	
0.02 mol/L Sodium Chloride Solution					
	for Volumetric Analysis		500 mL	195-12555	
0.01 mol/L Sodium Chloride Solution					
	for Volumetric Analysis		500 mL	198-12545	

<Sodium Hydroxide>

8 mol/L Sodium Hydroxide Solution (8N)					
	for Volumetric Analysis		500 mL	194-09575	
5 mol/L Sodium Hydroxide Solution (5N)					
	for Volumetric Analysis		100 mL	194-05371	
			500 mL	196-05375	
4 mol/L Sodium Hydroxide Solution (4N)					
	for Volumetric Analysis		500 mL	193-05385	
2 mol/L Sodium Hydroxide Solution (2N)					
	for Volumetric Analysis		100 mL	194-05631	
			500 mL	196-05635	
1 mol/L Sodium Hydroxide Solution (1N)					
			100 mL	190-02171	
	for Volumetric Analysis		500 mL	192-02175	
			3 L	196-02173	*1
	for Volumetric Analysis (Standardized by General Tests of the JP		500 mL	190-13085	
0.5 mol/L Sodium Hydroxide Solution (N/2)					
	for Volumetric Analysis		500 mL	199-02185	
0.2 mol/L Sodium Hydroxide Solution (N/5)					
	for Volumetric Analysis		100 mL	198-05391	
			500 mL	190-05395	
0.1 mol/L Sodium Hydroxide Solution (N/10)					
			100 mL	194-02191	
	for Volumetric Analysis		500 mL	196-02195	
			3 L	190-02193	
	for Volumetric Analysis (Standardized by General Tests of the JP		500 mL	197-13095	
0.05 mol/L Sodium Hydroxide Solution (N/20)					
	for Volumetric Analysis		500 mL	191-09585	
0.02 mol/L Sodium Hydroxide Solution (N/50)					
	for Volumetric Analysis		500 mL	198-05195	
0.01 mol/L Sodium Hydroxide Solution (N/100)					
	for Volumetric Analysis		500 mL	191-05205	

<Sodium Nitrite>

0.5 mol/L Sodium Nitrite Solution					
	for Volumetric Analysis		500 mL	192-12565	

Description	Grade	Note	Pkg. Size	Wako Cat. No.	
0.25 mol/L Sodium Oxalate Solution (N/2)					
	for Volumetric Analysis		500 mL	199-12575	
0.125 mol/L Sodium Oxalate Solution (N/4)					
	for Volumetric Analysis		500 mL	196-12585	
0.05 mol/L Sodium Oxalate Solution (N/10)					
	for Volumetric Analysis		500 mL	190-05415	
0.0125 mol/L Sodium Oxalate Solution (N/40)					
	for Volumetric Analysis		500 mL	199-07065	
			3 L	197-07061	
			10 L	195-07067	
0.005 mol/L Sodium Oxalate Solution (N/100)					
	for Volumetric Analysis		500 mL	192-10125	
<Sodium Thiosulfate>					
1 mol/L Sodium Thiosulfate Solution (1N)					
	for Volumetric Analysis		500 mL	197-05425	
0.5 mol/L Sodium Thiosulfate Solution (N/2)					
	for Volumetric Analysis		500 mL	191-11935	
0.2 mol/L Sodium Thiosulfate Solution (N/5)					
	for Volumetric Analysis		500 mL	193-12095	
0.1 mol/L Sodium Thiosulfate Solution (N/10)					
	for Volumetric Analysis		100 mL	199-03621	
			500 mL	191-03625	
			3 L	195-03623	
0.05 mol/L Sodium Thiosulfate Solution (N/20)					
	for Volumetric Analysis		500 mL	192-09635	
0.025 mol/L Sodium Thiosulfate Solution (N/40)					
	for Volumetric Analysis		100 mL	198-08711	
			500 mL	190-08715	
0.02 mol/L Sodium Thiosulfate Solution (N/50)					
	for Volumetric Analysis		500 mL	191-05565	
0.01 mol/L Sodium Thiosulfate Solution (N/100)					
	for Volumetric Analysis		100 mL	196-05571	
			500 mL	198-05575	
0.005 mol/L Sodium Thiosulfate Solution (N/200)					
	for Volumetric Analysis		500 mL	197-06145	
<Sulfuric Acid>					
1 mol/L Sulfuric Acid (2N)					
	for Volumetric Analysis		500 mL	198-09595	
0.5 mol/L Sulfuric Acid (1N)					
	for Volumetric Analysis		500 mL	192-04755	
			100 mL	190-04751	
0.25 mol/L Sulfuric Acid (N/2)					
	for Volumetric Analysis		500 mL	199-04765	
0.1 mol/L Sulfuric Acid (N/5)					
	for Volumetric Analysis		500 mL	191-05445	
0.05 mol/L Sulfuric Acid (N/10)					
	for Volumetric Analysis		100 mL	194-04771	
			500 mL	196-04775	
			3 L	190-04773	*1
	for Volumetric Analysis (Standardized by General Tests of the JP		500 mL	190-13105	
0.025 mol/L Sulfuric Acid (N/20)					
	for Volumetric Analysis		500 mL	194-05435	
0.01 mol/L Sulfuric Acid (N/50)					
	for Volumetric Analysis		500 mL	192-05235	
0.005 mol/L Sulfuric Acid (N/100)					
	for Volumetric Analysis		500 mL	199-05245	
<Tetraammonium Cerium (IV) Sulfate>					
0.1 mol/L Tetraammonium Cerium (IV) Sulfate Solution					
	for Volumetric Analysis		500 mL	202-15635	
<Zinc>					
0.1 mol/L Zinc Solution (N/5)					
	for Volumetric Analysis		500 mL	264-01725	
0.05 mol/L Zinc Solution (N/10)					
	for Volumetric Analysis		500 mL	267-01715	
0.01 mol/L Zinc Solution (N/50)					
	for Volumetric Analysis		500 mL	261-01735	

Description	Grade	Note	Pkg. Size	Wako Cat. No.
<Zinc Acetate>				
0.1 mol/L Zinc Acetate Solution (N/5)				
	for Volumetric Analysis		500 mL	267-01575
0.01 mol/L Zinc Acetate Solution (N/50)				
	for Volumetric Analysis		500 mL	260-01685

2. Reference Materials for Volumetric Analysis

TraceSure Series are certified reference materials that have obtained ASNITE（Accreditation System of National Institute of Technology and Evaluation) (Guide 34) at Wako from International Accreditation Japan (IAJapan) by the Accreditation Program.

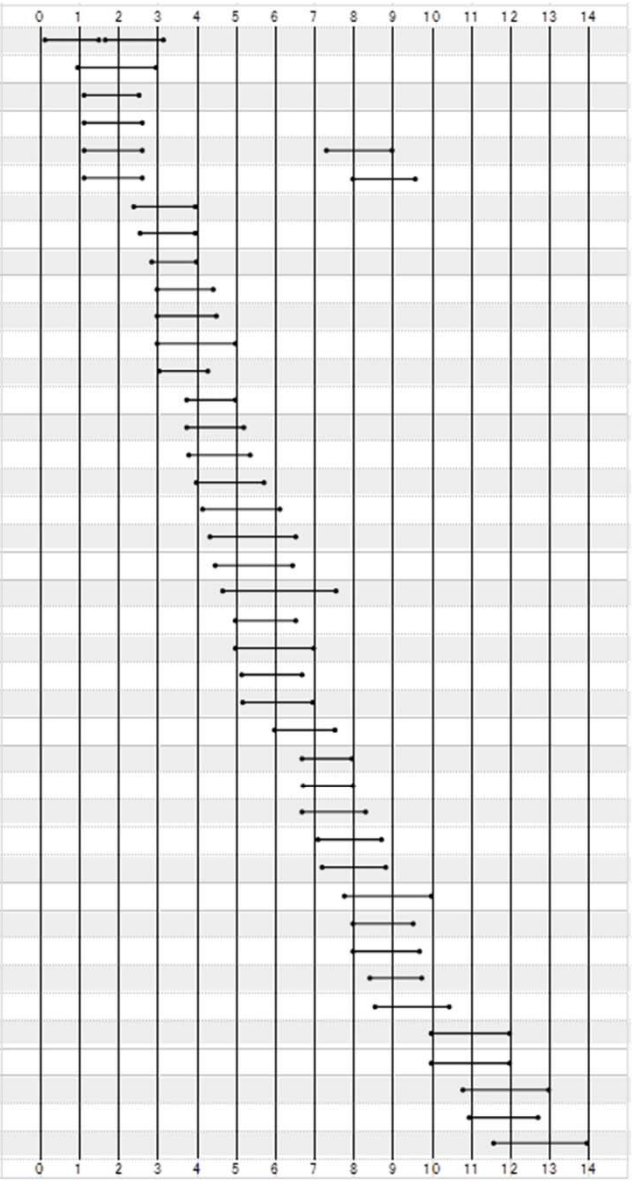
Amidosulfuric Acid, 99.9+% (Wt)			
TraceSure		50 g	015-23371
Potassium Dichromate, 99.98+% (mass/mass)			
TraceSure		50 g	167-25001
Potassium Hydrogen Phthalate, 99.95～100.05% (Wt)			
TraceSure		50 g	161-24661
Potassium Iodate, 99.95+% (mass/mass)			
TraceSure		50 g	160-24991
Sodium Carbonate, 99.97+% (Ti)			
TraceSure		50 g	190-16221
Sodium Chloride, 99.98+% (Ti)			
for Volumetric Analysis		50 g	197-10871
Sodium Oxalate, 99.95+% (Wt)			
TraceSure		50 g	192-15941

3. Indicators

Highly versatile indicators and indicator solutions are readily available, centering around titration indicators listed in JIS K8001.

<pH Indicators - Color Change Interval List ->

Substance	Color Change Interval (pH)		
Methyl Violet	(greenish yellow)	0.1～1.5	(blue) (purple)
Brilliant Green	(yellow)	1.0～3.0	(blue-green)
Metanil Yellow	(red)	1.2～2.3	(yellow)
4-Phenylazodiphenylamine	(red)	1.2～2.6	(yellow)
Metacresol Purple	[acid] (red)	1.2～2.8	(yellow) / [basic] (yellow) 7.4～9.0 (purple)
Thymol Blue	[acid] (red)	1.2～2.8	(yellow) / [basic] (yellow) 8.0～9.6 (blue)
2,6-Dinitrophenol	(slightly yellow)	2.4～4.0	(yellow)
2,4-Dinitrophenol	(slightly pale yellow)	2.6～4.0	(yellow)
Methyl Yellow	(pale purplish red)	2.9～4.0	(pale reddish yellow)
Ethyl Orange	(pale sanguine)	3.0～4.5	(pale orange)
Bromophenol Blue	(yellow)	3.0～4.6	(blue-purple)
Congo Red	(purple)	3.0～5.0	(dark reddish orange)
Methyl Orange	(yellowish red)	3.1～4.4	(reddish yellow)
Naphthyl Red Hydrochloride	(red)	3.7～5.0	(yellow-orange)
Alizarin Red S	(yellow)	3.7～5.2	(yellowish red)
Bromocresol Green	(yellow)	3.8～5.4	(blue)
2,5-Dinitrophenol	(slightly pale yellow)	4.0～5.8	(yellow)
Methyl Red	(purplish red)	4.2～6.2	(yellow)
Lacmoid	(red)	4.4～6.6	(blue)
Ethyl Red	(sanguine)	4.5～6.5	(orange)
p-Nitrophenol	(slightly pale yellow)	4.8～7.6	(yellow)
Chlorophenol Red	(reddish yellow)	5.0～6.6	(red-purple)
o-Nitrophenol	(slightly pale yellow)	5.0～7.0	(yellow)
Bromocresol Purple	(yellow)	5.2～6.8	(purple)
Bromophenol Red	(yellow)	5.2～7.0	(red-purple)
Bromothymol Blue	(yellow)	6.0～7.6	(blue)
Neutral Red	(red)	6.8～8.0	(yellowish orange)
Rosolic Acid	(yellow-red)	6.8～8.0	(red)
Phenol Red	(yellow)	6.8～8.4	(red)
alpha-Naphtholphthalein	(pale reddish orange)	7.1～8.7	(blue)
Cresol Red	(yellow)	7.2～8.8	(red)
Phenolphthalein	(colorless)	7.8～10.0	(sanguine)
p-Xylenol Blue	(yellow)	8.0～9.6	(blue)
o-Cresolphthalein	(colorless)	8.0～9.8	(sanguine)
p-Naphtholbenzein	(yellow)	8.5～9.8	(green)
Thymolphthalein	(colorless)	8.6～10.5	(blue)
Alizarin Yellow G	(yellow)	10.0～12.0	(orange-yellow)
Alizarin Yellow R	(reddish yellow)	10.0～12.0	(yellowish red)
Tetryl	(colorless)	10.8～13.0	(red-brown)
Tropaeolin O	(yellow)	11.0～12.8	(yellowish orange)
Indigo Carmine	(blue)	11.6～14.0	(yellow)



Description	Grade	Note	Pkg. Size	Wako Cat. No.
BANASS-Brilliant Yellow Methanol (90) Solution				
	for Titration		100 mL	025-14641
4,4'-Bis(4-amino-1-naphtylazo)-2,2'-stilbenedisulfonic Acid				
	for Indicator		5 g	021-14481
4,4'-Bis(4-amino-1-naphtylazo)-2,2'-stilbenedisulfonic Acid				
	for Indicator		25 g	029-14482
0.04 w/v% Bromocresol Green Solution				
	for pH Analysis		500 mL	025-14565
0.1 w/v% Bromocresol Green Ethanol (50) Solution				
	for Titration		100 mL	022-14553
Bromocresol Green-Methyl Red Ethanol Solution				
	for Titration		100 mL	026-14573
Bromocresol Green-Methyl Red Ethanol Solution				
	for Titration		500 mL	022-14575
0.04 w/v% Bromocresol Purple Solution				
	for pH Analysis		100 mL	020-14593
0.1 w/v% Bromophenol Blue Ethanol (50) Solution				
	for Neutralization Titration		100 mL 500 mL	026-11413 022-11415
0.04 w/v% Bromothymol Blue Solution				
	for pH Analysis		100 mL 500 mL	020-14613 026-14615
0.1 w/v% Bromothymol Blue Ethanol (50) Solution				
	for Titration		100 mL 500 mL	023-14603 029-14605
0.18 w/v% Indigo Carmine Solution				
			100 mL	099-04871
0.04 w/v% Metacresol Purple Solution				
	for pH Analysis		100 mL	134-14143
0.1 w/v% Methyl Orange Solution				
	for Neutralization Titration		100 mL 500 mL	132-10783 138-10785
Methyl Orange-Xylene Cyanol FF Ethanol (50) Solution				
	for Neutralization Titration		500 mL	131-10775
0.04 w/v% Methyl Red Solution				
	for pH Analysis		100 mL 500 mL	130-14123 136-14125
0.1 w/v% Methyl Red Ethanol Solution				
	for Titration		100 mL 500 mL	133-14113 139-14115
Methyl Red-Methylene Blue Ethanol Solution				
	for Titration		100 mL	137-14133
0.2 w/v% p-Nitrophenol Solution				
	for Titration		100 mL	142-07393
1.0 w/v% Phenolphthalein Ethanol (90) Solution				
	for Neutralization Titration		100 mL 500 mL	163-15733 169-15735
0.1 w/v% Phenolphthalein Ethanol (90) Solution				
	for Titration		100 mL 500 mL	166-20593 162-20595
0.04 w/v% Phenolphthalein Ethanol (40) Solution				
	for pH Analysis		100 mL	169-20603
0.04 w/v% Phenol Red Solution				
	for pH Analysis		100 mL	163-20623
0.1 w/v% Thymol Blue Ethanol (50) Solution				
	for Neutralization Titration		500 mL	203-11765
0.1 w/v% Thymolphthalein Ethanol Solution				
	for Neutralization Titration		500 mL	200-11775
0.2 w/v% Uranine Solution				
	for Titration		100 mL 500 mL	218-01083 214-01085
0.1 w/v% Xylenol Orange Solution				
	for Titration		100 mL	244-00743

Description	Grade	Note	Pkg. Size	Wako Cat. No.

4. Buffer Solution Standard

Buffer Solution Standard (Phthalate pH Standard Solution), pH 4.01 (25℃)

		500 mL	028-03185

Buffer Solution Standard (Phosphate pH Standard Equimolal Solution), pH 6.86 (25℃)

		500 mL	025-03195

Buffer Solution Standard (Tetraborate pH Standard Solution), pH 9.18 (25℃)

		500 mL	028-03205

<JCSS certified products>

Wako has been qualified as an institution for calibration (licensed trader) of standard pH solutions, standard metal solutions and standard ion solutions by the Minister of Economy, Trade and Industry and offers the standard solutions traceable according to the National Metrology Standard. These products are provided with a calibration certificate marked with JCSS to certify that it is traceable according to the National Metrology Standard and, at the same time, attests to the supply of accurate and highly reliable reagent.

Carbonate pH Standard Solution, pH 10.01 (25℃)

	JCSS	500 mL	037-16145

Oxalate pH Standard Solution, pH 1.68 (25℃)

	JCSS	500 mL	151-01845

Phthalate pH Standard Solution, pH 4.01 (25℃)

	JCSS	100 mL 500 mL	166-12141 168-12145

Phosphate pH Standard Equimolal Solution, pH 6.86 (25℃)

	JCSS	100 mL 500 mL	163-12151 165-12155

Phosphate pH Standard Solution, pH 7.41 (25℃)

	JCSS	500 mL	166-17445

Tetraborate pH Standard Solution, pH 9.18 (25℃)

	JCSS	100 mL 500 mL	203-08771 205-08775

<Reagents for pH Standard Solution>

Disodium Hydrogenphosphate, 99.5+% (Ti)

	JIS; for pH Standard Solutior	500 g	195-05725

Potassium Dihydrogen Phosphate, 99.6+% (Ti)

	JIS; for pH Standard Solutior	500 g	163-04265

Potassium Hydrogen Phthalate, 99.9～100.1% (Ti)

	JIS; for pH Standard Solution	25 g 500 g	167-03842 161-03845

Potassium Trihydrogen Dioxalate Dihydrate, 99.8+% (Ti)

	JIS; for pH Standard Solution	25 g 500 g	162-04132 166-04135

Sodium Carbonate, 99.8～100% (Ti)

	JIS; for pH Standard Solutior	500 g	199-01605

Sodium Hydrogen Carbonate, 99.7～100% (Ti)

	JIS; for pH Standard Solutior	500 g	195-01325

Sodium Tetraborate Decahydrate, 99.6～100.5% (Ti)

	JIS; for pH Standard Solutior	500 g	198-01435

5. Reagents for Electrode

In potentiometric titration, polarographic method, controlled-potential electrolysis, pH measurement (by glass electrode), etc., calomel electrodes, silver-silver chloride electrodes, and other electrodes are used for reference electrodes. As the electrolyte solution of reference electrodes such as calomel electrodes, silver-silver chloride electrodes, etc., a potassium chloride solution of a predetermined concentration is used. In addition, the potassium chloride solution is used for the electrode preservation solution, too.

Potassium Chloride Saturated Solution, 25.0+% (20℃)

	for Electrode	500 mL	166-20375

1 mol/L Potassium Chloride Solution

	for Electrode	500 mL	163-20405

3 mol/L Potassium Chloride Solution

	for Electrode	500 mL	160-20395

3.3 mol/L Potassium Chloride Solution

	for Electrode	500 mL	163-20385

3.3 mol/L Potassium Chloride Solution containing Silver Chloride

	for Electrode	500 mL	160-20415

Description	Grade	Note	Pkg. Size	Wako Cat. No.

6. Reagents for Colloidal Titration

The colloidal titration method is titrimetry for simply determine the polymer electrolyte by titration. In general, colloids having positive or negative electric charges stoichiometrically react with colloids having opposite electric charges and form a sparingly water-soluble precipitation. In the event that the positive colloid is determined by the use of this principle, the solution is titrated with the normal solution of potassium polyvinyl sulfate (PVSK) having a negative electric charge. Toluidine blue of the indicator is a basic dyestuff having -NH$_2$ and is not absorbed by the positive colloid, showing an original blue color, but when it encounters with a negative colloid, toluidine blue is immediately absorbed and assumes a red-purple color. The equivalent point of the reaction is, therefore, able to be simply and highly accurately detected.

Glycol Chitosan, 60.0+% (Ti)			
for Colloidal Titration		10 g	072-01581
Glycol Chitosan Titration Solution (N/200)			
for Colloidal Titration		500 mL	072-05045
Lithium Tetraborate Anhydrous, 98.0+% (Ti)			
Wako Special Grade		25 g	129-03602
Wako Special Grade		500 g	123-03605
Methyl Glycol Chitosan, 60.0+% (Ti)			
for Colloidal Titration		10 g	134-04731
Methyl Glycol Chitosan Titration Solution (N/200)			
for Colloidal Titration		500 mL	137-14655
0.0025N Poly(diallyldimethylammonium Chloride) Solution			
for Colloidal Titration		500 mL	161-14695
Potassium Polyvinyl Sulfate			
for Colloidal Titration		10 g	162-03071
Potassium Polyvinyl Sulfate Titration Solution (N/400)			
for Colloidal Titration		500 mL	164-21655
0.1 w/v% Toluidine Blue Indicator Solution			
for Colloidal Titration		50 mL	205-05811

7. Reagents for Non-aqueous Titration

In the event that an acid and a base are too weak to be titrated in an aqueous solution, they are titrated in an appropriate nonaqueous solvent. A wide range of solvents, standard solutions, and indicators are lined up for nonaqueous titration.

Acetic Acid, 99.7+% (Ti)			
for Non-aqueous Titration		500 mL	012-08285
0.2 w/v% Azoviolet Benzene Solution			
for Non-aqueous Titration		50 mL	015-07371
1 w/v% Crystal Violet Acetic Acid Solution			
for Non-aqueous Titration		50 mL	031-07331
1,4-Dioxane, 99.0+% (cGC)			
for Non-aqueous Titration		500 mL	047-03755
0.2 w/v% *p*-Naphtholbenzein Acetic Acid Solution			
for Non-aqueous Titration		50 mL	147-03661
0.1 mol/L Perchloric Acid (Acetic Acid Solution)(N/10)			
for Non-aqueous Titration		500 mL	161-07505
0.1 mol/L Potassium Methoxide Benzene-Methanol Solution			
for Non-aqueous Titration		500 mL	168-07515
10 % Tetrabutylammonium Hydroxide Methanol Solution			
for Non-aqueous Titration		25 mL	205-14422

8. Karl Fischer Reagents [Mitsubishi Chemical Corp.]

Karl Fisher method uses Karl Fischer reagent, which reacts quantitatively and selectively with water, to measure moisture content. Fischer reagent consists of iodine, sulfur dioxide, a base and a solvent, such as alcohols. This method can be used in both coulometric and volumetric titration systems

<Reagents for Coulometric Titration>

There are two types of coulometric reagents: the anolyte (generating solution), which is placed in the anode chamber of the electrolysis and the catholyte (counter electrolyte), which is placed in the cathode chamber. There are also special anolyte for use with ketones, lower carboxylic acids and silicone oils. AQUAMICRON® can be used in coulometric moisture measurement systems sold by various companies, and it has a worldwide reputation for excellent performance.

Aquamicron® AX			
[Mitsubishi Chemical Corp.	XAMA	500 mL	604-07485
Aquamicron® AX01			
[Mitsubishi Chemical Corp.	XAMA01	100 mL	633-07051
Aquamicron® AS			
[Mitsubishi Chemical Corp.	SAMA	500 mL	601-07255
Aquamicron® AKX			
[Mitsubishi Chemical Corp.	AKX	500 mL	605-07591
Aquamicron® CXU			
[Mitsubishi Chemical Corp.	CXU	5 mL x 10	602-07501
Aquamicron® FLS			
[Mitsubishi Chemical Corp.	FLS	500 mL	632-07065

Description	Grade	Note	Pkg. Size	Wako Cat. No.

Description	Specification	Usage
<Anolyte>		
Aquamicron® AX	Moisture maximum: 0.15 mg H_2O/mL	[General purpose anolyte] To be used for organic solvents, inorganic chemicals, petroleum products, various gases, and other wide range of applications.
Aquamiron® AX01	Moisture maximum: 0.15 mg H_2O/mL	[General purpose anolyte] In addition to the foregoing, particularly suited for small-amount consumption. Disposable type AX
Aquamiron® AS	Moisture maximum: 0.15 mg H_2O/mL	[Anolyte for oils] Petroleum products in general, in particular, light oil, lower carboxylic acid, *etc*.
Aquamiron® AKX	Moisture maximum: 0.15 mg H_2O/mL	[Anolyte for ketone] Ketone, silicone oil, lower carboxylic acid, *etc*.
<Catholyte>		
Aquamiron® CXU	Moisture maximum: 0.6 mg H_2O/mL	Commonly used for AX, AS, and AKX
<One-component type>		
Aquamiron® FLS	Moisture maximum: 0.15 mg H_2O/mL	Alcohols, esters, hydrocarbons (benzene and toluene), *etc*.

<Reagents for Volumetric Titration>

The items required for volumetric titration are a Karl Fischer titrant and methanol or a dehydrated solvent (used to dissolve or disperse the sample). AQUAMICRON® offers a wide range of products suitable for measuring the moisture content of various samples at every level. Users can select a solvent that is suitable for the samples based on the following tables.

[SS-Z Series (pyridine-free chloroform-free type)]

Aquamicron® Titrant SS-Z 1 mg
[Mitsubishi Chemical Corp. SSZ10M 500 mL 631-03495

Aquamicron® Titrant SS-Z 3 mg
[Mitsubishi Chemical Corp. SSZ30M 500 mL 634-03505

Aquamicron® Titrant SS-Z 5 mg
[Mitsubishi Chemical Corp. SSZ50M 500 mL 631-03515

Aquamicron® Titrant SS-Z 5 mg
[Mitsubishi Chemical Corp. SSZ50L 1 L 636-03521

Aquamicron® Anhydrated Solvent GEX
[Mitsubishi Chemical Corp. GEX 500 mL 608-07525

Aquamicron® Anhydrated Solvent OLX
[Mitsubishi Chemical Corp. OLX 500 mL 635-03535

Aquamicron® Anhydrated Solvent OL Ⅱ
[Mitsubishi Chemical Corp. OL2 500 mL 605-07535

Aquamicron® Anhydrated Solvent KTX
[Mitsubishi Chemical Corp. KTX 500 mL 632-03545

Aquamicron® Anhydrated Solvent SU
[Mitsubishi Chemical Corp. SSU 500 mL 603-07335

Description	Specification	Usage
<Titrant>		
AQUAMICRON® Titrant SS-Z 1 mg	Titer: 0.7 - 1.2 mg H_2O/mL	【For General-Use】Low moisture content samples
AQUAMICRON® Titrant SS-Z 3 mg	Titer: 2.5 - 3.5 mg H_2O/mL	【For General-Use】
AQUAMICRON® Titrant SS-Z 5 mg	Titer: 4.5 - 5.5 mg H_2O/mL	【For General-Use】High moisture content samples
<Anhydrated solvent>		
AQUAMICRON® Solvent GEX	Moisture: max. 0.2 mg H_2O/mL	【For General-Use】Organic solvents, Inorganic chemicals, Agricultural chemicals, Pharmaceuticals, Fertilizers, Detergents, Foodstuffs, *etc*.
AQUAMICRON® Solvent OLX	Moisture: max. 0.5 mg H_2O/mL	【For Oils】Naphtha, Gasoline, Diesel oil, Electrical insulation oil, *etc*.
AQUAMICRON® Solvent OLII	Moisture: max. 0.2 mg H_2O/mL	【For Oils and Fats】Naphtha, Gasoline, Diesel oil, Heavy oil, Electrical insulation oil, Oils and Fats(Hardened oil, Margarine, etc.),*etc*.
AQUAMICRON® Solvent KTX	Moisture: max. 0.5 mg H_2O/mL	【For Ketones】Ketones, Silicone oils, Acetic and other lower carboxylic acids, aldehydes(except acetaldehydes), *etc*.
AQUAMICRON® Solvent SU	Moisture: max. 0.2 mg H_2O/mL	【For Sugars】Sugars, Proteins, Gelatin, Additives, Animal feeds, *etc.*

[SS Series (pyridine type)]

Aquamicron® Titrant SS 1 mg
[Mitsubishi Chemical Corp. GKS10M 500 mL 608-07025

Aquamicron® Titrant SS 3 mg
[Mitsubishi Chemical Corp. GKS30M 500 mL 601-07015

Aquamicron® Titrant SS 10 mg
[Mitsubishi Chemical Corp. GKS100M 500 mL 603-07215

Aquamicron® Anhydrated Solvent ML
[Mitsubishi Chemical Corp. GML 500 mL 600-07085

Aquamicron® Anhydrated Solvent MS
[Mitsubishi Chemical Corp. GMS 500 mL 604-07125

Description	Grade	Note	Pkg. Size	Wako Cat. No.
Aquamicron® Anhydrated Solvent CM				
[Mitsubishi Chemical Corp.	GCM		500 mL	603-07075
Aquamicron® Anhydrated Solvent CP				
[Mitsubishi Chemical Corp.	GCP		500 mL	604-07245
Aquamicron® Anhydrated Solvent PP				
[Mitsubishi Chemical Corp.	GPP		500 mL	600-07105
Aquamicron® Anhydrated Solvent PE				
[Mitsubishi Chemical Corp.	GPE		500 mL	606-07065
Aquamicron® Anhydrated Solvent FM				
[Mitsubishi Chemical Corp.	GFM		500 mL	607-07095
Aquamicron® Anhydrated Solvent ME				
[Mitsubishi Chemical Corp.	GME		500 mL	607-07115

Description	Specification	Usage
AQUAMICRON® Titrant SS 1 mg	Titer: 0.7 - 1.2 mg H_2O/mL	【For General-Use】Low moisture content samples
AQUAMICRON® Titrant SS 3 mg	Titer: 2.5 - 3.5 mg H_2O/mL	【For General-use】
AQUAMICRON® Titrant SS 10 mg	Titer: 8 - 12 mg H_2O/mL	【For General-use】High moisture content samples
AQUAMICRON® Solvent ML	Moisture: max. 0.2 mg H_2O/mL	【For General-use】 Organic solvents, Inorganic chemicals, Agricultural chemicals, Pharmaceuticals, Fertilizers, Detergents, Foodstuffs, *etc*.
AQUAMICRON® Solvent MS		
AQUAMICRON® Solvent CM	Moisture: max. 0.3 mg H_2O/mL	【For Oils】Naphtha, Gasoline, Diesel oil, Heavy oil, Electrical insulation oil, Oils and Fats (Hardened oil, Margarine, etc.), *etc*.
AQUAMICRON® Solvent CP	Moisture: max. 0.5 mg H_2O/mL	【For Ketones】 Ketones, Silicone oils, Acetic and other lower carboxylic acids, aldehydes (except acetaldehydes), *etc*.
AQUAMICRON® Solvent PE	Moisture: max. 0.2 mg H_2O/mL	
AQUAMICRON® Solvent PP	Moisture: max. 0.2 mg H_2O/mL	【For Aldehyde】Acetaldehydes, propionaldehydes, Butyraldehydes, *etc*.
AQUAMICRON® Solvent FM	Moisture: max. 0.2 mg H_2O/mL	【For Sugar】Sugars, Proteins, Gelatin, Additives, Animal feeds, *etc*.
AQUAMICRON® Solvent ME	Moisture: max. 0.2 mg H_2O/mL	【Vaporizer】Gaseous samples, Nitrogen, *etc*.

[Standard Water Solutions]

For standardization of KF reagents and for checking the moisture content measuring apparatus in accordance with JIS, ISO, ASTM, and other guidelines, reliable standard samples are required. To meet such requirements, a wide range of standard samples are readily available.

AQUAMICRON® standard water solution is stringently manufactured at an ISO 9001 certified plant and conforms to JIS, ASTM, and ISO guidelines. In addition, AQUAMICRON® standard water solution has the traceability to NIST SRM2890, too. As a standard sample, AQUAMICRON® standard water solution contains an accurately defined amount of moisture, and an analytical test report is attached to all products, respectively.

Aquamicron® Water Standard 10 mg			
[Mitsubishi Chemical Corp.	AWS100	8 mL ×10	608-07581
Aquamicron® Standard Water Methanol Solution 2 mg			
[Mitsubishi Chemical Corp.	GMW20	250 mL	600-07041
Aquamicron® Water Standard 0.1 mg			
[Mitsubishi Chemical Corp.	AWS01	5 mL×10	639-15101
Aquamicron® Water Standard 0.2 mg			
[Mitsubishi Chemical Corp.	AWS02	5 mL×10	604-07561
Aquamicron® Water Standard 1 mg			
[Mitsubishi Chemical Corp.	AWS10	5 mL×10	601-07571
Aquamicron® Check Solution P			
[Mitsubishi Chemical Corp.	GCHP	100 mL	609-07511
Aquamicron® Solid Water Standard			
[Mitsubishi Chemical Corp.	SWS	10 g	637-07071

Description	Specifications	Applications
<Volumetric Titration>		
AQUAMICRON® Water standard 10 mg	Titer: 10 ± 0.5 mgH_2O/g	- For titer standardization of titrant
AQUAMICRON® Water methanol solution	Moisture content: 2.0 ± 0.04 mg H_2O/mL	- Titrant for back titration - For titer standardization of titrant
<Coulometric Titration Method>		
AQUAMICRON® Water standard 0.1 mg	Titer: 0.1±0.01 mgH_2O/g	- To check accuracy of coulometric titration method
AQUAMICRON® water standard 0.2 mg	Titer: 0.2 ± 0.01 mg H_2O/g	- To check accuracy of coulometric titration method
AQUAMICRON® Water standard 1 mg	Titer: 1 ± 0.05 mg H_2O/g	- To check accuracy of coulometric titration method
AQUAMICRON® Check solution P	Moisture content: 3.8 ~ 4.2 mgH_2O/mL	- End-point adjusting solution
<Vaporization Method>		
AQUAMICRON® Solid water standard sample (*)	Moisture content: 3.83 ± 0.1%	- Test of water vaporization system

* This is used for testing an aquameter combined with a water vaporization system. Because the moisture content is about 3.83%, which is lower than the substances conventionally used, the sample amount is able to be increased and the weighing error can be reduced. A written guarantee of test results and a convenient small scoop is attached.

Description	Grade	Note	Pkg. Size	Wako Cat. No.	

★Related Products★

"Aqua Control" is powder easy to handle as moisture control standard samples when the moisture content of chemical products is determined by the Karl Fischer's method, and in particular, suited for daily precision control for powder sample moisture measurement. Every dose of "Aqua Control" is packaged in an aluminum bag, thereby suppressing the moisture content to the minimum, and an instruction book that stipulates measured actual moisture content for each lot is attached.

Aqua Control

for Precision Control of Water Determination		300 mg × 10	015-17641
		300 mg × 50	011-17643

Following is anhydrous calcium chloride with comparatively uniform grain sizes, which are used by filling into U-tubes for moisture content measurement or for absorption. Use as desiccant.

Calcium Chloride, 90.0+ % (Ti)

for Water Determination		500 g	030-00525
		10 kg	036-00527

B. Reagents for NMR

1. Shift Reagents

Shift reagents improve separation of signals making the best of the properties that the NMR peak positions are shifted. Adding these reagents can separate signals and facilitate the analysis.

Chlorotris(triphenylphosphine) rhodium (I), 97.0+ % (Ti)

Wako 1st Grade		1 g	034-14271

Chlorotris (triphenylphosphine) rhodium (I), 97.0+ % (Ti)

Wako 1st Grade		5 g	030-14273

(*R*)-(+)-2-Methoxy-2-(trifluoromethyl)phenylacetic Acid, 97.0+ % (cGC)

for Nuclear Magnetic Resonance		1 g	138-09131

(*S*)-(-)-2-Methoxy-2-(trifluoromethyl)phenylacetic Acid, 97.0+ % (cGC)

for Nuclear Magnetic Resonance		1 g	131-09121

2. Internal Standard Reference Material

This is an internal standard reference material added to the NMR solvent when NMR is measured and is used for determining the shift positions of other peaks.

Tetramethylsilane, 99.5+ % (GC)

for Nuclear Magnetic Resonance		10 mL	201-08451	*2
		25 mL	209-08452	*2

3. NMR Test Tubes

NMR test tubes are high-quality reasonable NMR glass tubes. There are S (standard) type used for the routine and HG (high-grade) type with smaller outside diameter and suited for measurement in the high-frequency region. In addition, the total tube length is available in two sizes, 7 inches and 8 inches, so that the tubes can be chosen to fit to measurement instruments used.

NMR Test Tube HG-Type (φ4.951～4.965mm x 7 in.)

for Nuclear Magnetic Resonance		10 tubes	297-47951
		100 tubes	293-47953

NMR Test Tube HG-Type (φ4.951～4.965mm x 8 in.)

for Nuclear Magnetic Resonance		10 tubes	295-48351
		100 tubes	291-48353

NMR Test Tube S-Type (φ4.932～4.970mm x 7 in.)

for Nuclear Magnetic Resonance		10 tubes	291-47851
		100 tubes	297-47853

NMR Test Tube S-Type (φ4.932～4.970mm x 8 in.)

for Nuclear Magnetic Resonance		10 tubes	293-48151
		100 tubes	299-48153

Polyethylene Cap for NMR Test Tube

for Nuclear Magnetic Resonance	Blue	100 each	290-49401
for Nuclear Magnetic Resonance	Green	100 each	293-49251
for Nuclear Magnetic Resonance	Red	100 each	297-49151
for Nuclear Magnetic Resonance	White	100 each	299-49351
for Nuclear Magnetic Resonance	Yellow	100 each	291-49551

C. Reagents for ESR

1. Reagents for Spin Labeling

The spin labeling method is a method for bonding radicals observed by ESR (Electron Spin Resonance) to target molecules, measuring the spectrum, and analyzing radicals and the surrounding conditions of the radicals. The spin labeling method is used not only in the biochemistry, medical science, and other regions but also in other wide areas of polymer chemistry, complex chemistry, analytical chemistry, etc.

4-Acetamido-TEMPO, free radical, 97.0+ % (GC)

Wako Chemical, Ltd.		5 g	324-32941
		25 g	322-32942

4-Amino-2,2,6,6-tetramethylpiperidine-1-oxyl

for Spin Labeling		1 g	012-09961

Description	Grade	Note	Pkg. Size	Wako Cat. No.	
Galvinoxyl					
	for Spin Labeling		1 g	074-02141	
4-Hydroxy-TEMPO Benzoate, free radical,97.0+ % (GC)					
	Wako Chemical, Ltd.		1 g 5 g	320-75021 326-75023	
4-Hydroxy-2,2,6,6-tetramethylpiperidine-1-oxyl [4-Hydroxy-TEMPO], 98+ % (cGC)					
	for Spin Labeling		1 g	089-04191	
4-Oxo-TEMPO,free radical, 98.0+% (GC)					
	Wako Chemical, Ltd.		5 g 25 g	321-63221 329-63222	
2,2,6,6-Tetramethyl-1-piperidinyloxy, Radical [TEMPO], 98.0+ % (cGC)					
			1 g	201-13123	
			5 g	205-13121	
			25 g	203-13122	
2,2,5,5-Tetramethyl-1-pyrrolidinyloxy-3-carboxamide [3-Carbamoyl-Proxyl], 95+ % (C.H.N)					
	for Spin Labeling		1 g	206-09241	
2,2,5,5-Tetramethyl-1-pyrrolidinyloxy-3-carboxylic Acid [3-Carboxy-Proxyl], 95+ % (Ti)					
	for Spin Labeling		500 mg	203-09251	

2. Reagents for Spin Trapping

In general, superoxide radical ($O_2^{\cdot-}$) and hydroxyl radical ($^{\cdot}OH$) are unstable. They are allowed to react with reagents for spin trapping to be stabilized, and are detected by ESR.

5,5-Dimethyl-4-phenyl-1-pyrroline *N*-Oxide [4PDMPO], 98+ % (HPLC)				
for Spin Trapping		1 g	048-26181	
5,5-Dimethyl-1-pyrroline *N*-Oxide, 94.0+ % (GC)				
Wako Chemical, Ltd.		1 g 5 g	350-20111 356-20113	

D. Reagents for Atomic Absorption Spectrochemical Analysis

1. Reagents for Atomic Absorption Spectrochemical Analysis

Atomic absorption spectrochemical analysis is used for determination of trace metals. Because of high sensitivity, high selectivity, and easy operation, atomic absorption spectrochemical analysis is an important analysis method of heavy meals in water, soil, and biological samples. As reagents used for atomic absorption spectrochemical analysis, high-quality pretreatment reagents of acids, alkalis, etc. and metal standard solutions with extremely little content of heavy metal impurities are readily available.

<Reducers>

Hydroxylammonium Chloride, 97+ % (Ti)				
for Atomic Absorption Spectrochemical Analysis		100 g 500 g	087-03391 089-03395	
Sodium Tetrahydroborate, 95.0+ % (Gas Method)				
for Atomic Absorption Spectrochemical Analysis		25 g 100 g	196-10542 198-10541	*3 *3
Zinc				
JIS; for Arsenic Analysis	90.0+% (Ti), powder	100 g 500 g	266-00901 268-00905	
JIS ; for Arsenic Analysis	shot	500 g	266-00065	
JIS ; for Arsenic Analysis	sandy	500 g	267-00095	
JIS ; for Arsenic Analysis	granular	500 g	264-00125	

<Pretreatment Reagent>

Hydrogen Peroxide, abt. 30%			
for Atomic Absorption Spectrochemical Analysis	500 mL	085-04056	

<Masking Reagent>

Potassium Sodium (+)-Tartrate Tetrahydrate			
for Atomic Absorption Spectrochemical Analysis, 99.5+ % (Ti)	500 g	196-07075	
for Atomic Absorption Spectrochemical Analysis, 99.0+ % (Ti)	500 g	015-07935	

<Chemical Interference Inhibitor>

Lanthanum Chloride Solution			
for Atomic Absorption Spectrochemical Analysis, La : abt. 10 % in dil. HCl	100 mL	124-02351	
for Atomic Absorption Spectrochemical Analysis, 99.0+% (Ti)	100 g	195-07361	
Magnesium Nitrate Solution (10 mg Mg/mL 15% Nitric Acid Solution)			
for Atomic Absorption Spectrochemical Analysis	100 mL	132-13321	
Nickel (II) Nitrate Solution (10 mg Ni/mL 15% Nitric Acid Solution)			
for Atomic Absorption Spectrochemical Analysis	100 mL	141-06981	
Palladium (II) Nitrate Solution (5 mg/L Pd Nitric acid (1 + 1) solution			
for Atomic Absorption Spectrochemical Analysis	100 mL	163-17531	

<Reagents for Extraction>

Ammonium Sulfate, 99.5+ % (Ti)			
for Atomic Absorption Spectrochemical Analysis	500 g	016-08205	

Description	Grade	Note	Pkg. Size	Wako Cat. No.	
Butyl Acetate (*n*-Butyl Acetate), 99.5+ % (cGC)					
	for Atomic Absorption Spectrochemical Analysis		500 mL	021-06115	
***N*-Cinnamoyl-N-2,3-xylylhydroxylamine**					
	for Vanadium Determination		1 g	036-09601	
2,6-Dimethyl-4-heptanone, 90.0+ % (cGC)					
	for Atomic Absorption Spectrochemical Analysis		500 mL	046-18855	
4-Methyl-2-pentanone, 99.5+ % (cGC)					
	for Atomic Absorption Spectrochemical Analysis		500 mL 3 L	131-05645 139-05641	 *1
5-Octyloxymethyl-8-quinolinol, 99.0+ % (Ti)					
	for Atomic Absorption Spectrochemical Analysis		1 g 5 g	151-01541 157-01543	

<Chelate Reagents>

Ammonium *N,N*-Diethyldithiocarbamate				
for Atomic Absorption Spectrochemical Analysis			1 g x 5	013-07713
Ammonium 1-Pyrrolidinecarbodithioate				
for Atomic Absorption Spectrochemical Analysis			1 g 1 g x 5 25 g	015-05171 011-05173 013-05172
Sodium *N,N*-Diethyldithiocarbamate Trihydrate				
for Atomic Absorption Spectrochemical Analysis			10 g 100 g	190-07051 196-07053

★ Related Products ★

Diphenylarsinic Acid Standard, 97+ % (HPLC)				
for Arsenic Analysis			200 mg	040-29181
Dithizone, 85+ % (ABS)				
JIS Special Grade			5 g 25 g	048-04101 046-04102
Methylphenylarsinic Acid Standard, 95.0+ % (HPLC)				
for Arsenic Analysis			20 mg	138-16341
Methyldiphenylarsine Oxide Standard, 95.0+ % (HPLC)				
for Arsenic Analysis			20 mg	135-16351

2. Standard Metal Solutions

Wako has been qualified as an institution for calibration (licensed trader) of standard pH solutions, standard metal solutions and standard ion solutions by the Minister of Economy, Trade and Industry and offers the standard solutions traceable according to the National Metrology Standard. This product is provided with a calibration certificate marked with JCSS to certify that it is traceable according to the National Metrology Standard and, at the same time, attests to the supply of accurate and highly reliable reagent.

Aluminum Standard Solution (Al: 100 mg/L)				
JCSS	$Al(NO_3)_3$ in 0.5 mol/L HNO_3		100 mL	016-18271
Aluminum Standard Solution (Al: 1,000 mg/L)				
JCSS	$Al(NO_3)_3$ in 0.5 mol/L HNO_3		100 mL	016-15471
Antimony Standard Solution (Sb: 100 mg/L)				
JCSS	$SbCl_3$ in 3 mol/L HCl		100 mL	013-18281
Antimony Standard Solution (Sb: 1,000 mg/L)				
JCSS	$SbCl_3$ in 3 mol/L HCl		100 mL	010-15491
Arsenic Standard Solution (As: 1,000 mg/L)				
JCSS	As_2O_3 and NaOH in water pH 5.0 with HCl		100 mL	013-15481
Barium Standard Solution (Ba: 1,000 mg/L)				
JCSS	$BaCO_3$ in 0.1 mol/L HNO_3		100 mL	027-15321
Bismuth Standard Solution (Bi: 100 mg/L)				
JCSS	$Bi(NO_3)_3$ in 0.5 mol/L HNO_3		100 mL	023-14201
Bismuth Standard Solution (Bi: 1,000 mg/L)				
JCSS	$Bi(NO_3)_3$ in 0.5 mol/L HNO_3		100 mL	021-12661
Boron Standard Solution (B: 1,000 mg/L)				
JCSS	H_3BO_3 in H_2O		100 mL	025-16581
Cadmium Standard Solution (Cd: 100 mg/L)				
JCSS	$Cd(NO_3)_2$ in 0.1 mol/L HNO_3		100 mL	030-16211
Cadmium Standard Solution (Cd: 1,000 mg/L)				
JCSS	$Cd(NO_3)_2$ in 0.1 mol/L HNO_3		100 mL	036-16171

Description	Grade	Note	Pkg. Size	Wako Cat. No.
Calcium Standard Solution (Ca: 100 mg/L)				
	JCSS	$CaCO_3$ in 0.1 mol/L HNO_3	100 mL	036-17891
Calcium Standard Solution (Ca: 1,000 mg/L)				
	JCSS	$CaCO_3$ in 0.1 mol/L HNO_3	100 mL	039-16161
Cerium Standard Solution (Ce: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Ce(NO_3)_3$ in 1 mol/L HNO_3	100 mL	039-11661
Cesium Standard Solution (Cs 1,000 mg/L)				
	JCSS	CsCl in water	100 mL	030-21341
Chromium Standard Solution (Cr: 100 mg/L)				
	JCSS	$K_2Cr_2O_7$ in 0.1 mol/L HNO_3	100 mL	037-16221
Chromium Standard Solution (Cr: 1,000 mg/L)				
	JCSS	$K_2Cr_2O_7$ in 0.1 mol/L HNO_3	100 mL	030-16191
Cobalt Standard Solution (Co: 100 mg/L)				
	JCSS	$Co(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	039-17901
Cobalt Standard Solution (Co: 1,000 mg/L)				
	JCSS	$Co(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	033-16181
Copper Standard Solution (Cu: 100 mg/L)				
	JCSS	$Cu(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	034-16231
Copper Standard Solution (Cu: 1,000 mg/L)				
	JCSS	$Cu(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	033-16201
Dysprosium Standard Solution (Dy: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Dy(NO_3)_3$ in 1 mol/L HNO_3	100 mL	045-20111
Erbium Standard Solution (Er: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Er(NO_3)_3$ in 1 mol/L HNO_3	100 mL	054-04361
Europium Standard Solution (Eu: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Eu(NO_3)_3$ in 1 mol/L HNO_3	100 mL	051-04251
Gadolinium Standard Solution (Gd: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Gd(NO_3)_3$ in 1 mol/L HNO_3	100 mL	070-02481
Gallium Standard Solution (Ga: 1,000) mg/L)				
	JCSS	Ga in 0.5 mol/L HNO_3	100 mL	070-05781
Germanium Standard Solution (Ge: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	GeO_2 in H_2O	100 mL	077-02131
Gold Standard Solution (Au: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$HAuCl_4$ in 1 mol/L HCl	100 mL	077-01771
Holmium Standard Solution (Ho: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Ho(NO_3)_3$ in 1 mol/L HNO_3	100 mL	081-04651
Indium Standard Solution (In: 1,000 mg/L))				
	JCSS	In in 0.5 mol/L HNO_3	100 mL	092-05841
Iron Standard Solution (Fe: 100 mg/L)				
	JCSS	$Fe(NO_3)_3$ in 0.1 mol/L HNO_3	100 mL	091-03851
Iron Standard Solution (Fe: 1,000 mg/L)				
	JCSS	$Fe(NO_3)_3$ in 0.1 mol/L HNO_3	100 mL	094-03841
Lanthanum Standard Solution (La: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$La(NO_3)_3$ in 1 mol/L HNO_3	100 mL	127-02841
Lead Standard Solution (Pb: 100 mg/L)				
	JCSS	$Pb(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	127-04301
Lead Standard Solution (Pb: 1,000 mg/L)				
	JCSS	$Pb(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	124-04291
Lithium Standard Solution (Li: 1,000 mg/L)				
	JCSS	Li_2CO_3 in 0.2 mol/L HNO_3	100 mL	129-05221
Lutetium Standard Solution (Lu: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Lu(NO_3)_3$ in 1 mol/L HNO_3	100 mL	122-02911
Magnesium Standard Solution (Mg: 100 mg/L)				
	JCSS	$Mg(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	136-13601
Magnesium Standard Solution (Mg: 1,000 mg/L)				
	JCSS	$Mg(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	136-12121

Description	Grade	Note	Pkg. Size	Wako Cat. No.
Manganese Standard Solution (Mn: 100 mg/L)				
	JCSS	$Mn(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	139-12111
Manganese Standard Solution (Mn: 1,000 mg/L)				
	JCSS	$Mn(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	133-12131
Molybdenum Standard Solution (Mo: 1,000 mg/L)				
	JCSS	Mo in 0.4 mol/L HCl 0.2 mol/L HNO_3	100 mL	130-14961
Neodymium Standard Solution (Nd: 1,000 ppm)				
	for Atomic Absorption Spectrochemical Analysis,	$Nd(NO_3)_3$ in 1 mol/L HNO_3	100 mL	149-04841
Nickel Standard Solution (Ni: 100 mg/L)				
	JCSS	$Ni(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	144-06471
Nickel Standard Solution (Ni: 1,000 mg/L)				
	JCSS	$Ni(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	147-06461
Niobium Standard Solution (Nb: 1,000 ppm)				
	for Atomic Absorption Spectrochemical Analysis,	NbF_5 in 1 mol/L HF	100 mL	146-04971
Palladium Standard Solution (Pd: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$PdCl_2$ in 1 mol/L HCl	100 mL	166-08111
Platinum Standard Solution (Pt: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	H_2PtCl_6 in 1 mol/L HCl	100 mL	163-08121
Potassium Standard Solution (K: 100 mg/L)				
	JCSS	KCl in water	100 mL	162-19941
Potassium Standard Solution (K: 1,000 mg/L)				
	JCSS	KCl in water	100 mL	165-17471
Praseodymium Standard Solution (Pr: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Pr(NO_3)_3$ in 1 mol/L HNO_3	100 mL	161-12831
Rhodium Standard Solution (Rh: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Rh(NO_3)_3$ in 2 mol/L HNO_3	100 mL	183-00661
Rubidium Standard Solution (Rb: 1,000 mg/L)				
	JCSS	RbCl in water	100 mL	188-01951
Samarium Standard Solution (Sm: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Sm(NO_3)_3$ in 1 mol/L HNO_3	100 mL	195-08721
Scandium Standard Solution (Sc: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Sc(NO_3)_3$ in 1 mol/L HNO_3	100 mL	196-08751
Selenium Standard Solution (Se: 1,000 mg/L)				
	JCSS	Se in 0.1 mol/L HNO_3	100 mL	192-13861
Silicon Standard Solution (Si: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	Na_2SiO_3 in 0.2 mol/L Na_2CO_3	100 mL	192-06031
Silver Standard Solution (Ag: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$AgNO_3$ in 0.1 mol/L HNO_3	100 mL	199-06041
Sodium Standard Solution (Na: 100 mg/L)				
	JCSS	NaCl in water	100 mL	191-12111
Sodium Standard Solution (Na: 1,000 mg/L)				
	JCSS	NaCl in water	100 mL	199-10831
Strontium Standard Solution (Sr: 1,000 mg/L)				
	JCSS	$SrCO_3$ in 0.1 mol/L HNO_3	100 mL	199-13871
Tantalum Standard Solution (Ta: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	TaF_5 in 1 mol/L HF	100 mL	206-08141
Tellurium Standard Solution (Te: 1,000 mg/L)				
	JCSS	Te in 1 mol/L HCl	100 mL	209-17921
Terbium Standard Solution (Tb: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Tb(NO_3)_3$ in 1 mol/L HNO_3	100 mL	209-08871
Thallium Standard Solution (Tl: 1,000 mg/L)				
	JCSS	$TlNO_3$ in 1 mol/L HNO_3	100 mL	205-16301
Thulium Standard Solution (Tm: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Tm(NO_3)_3$ in 1 mol/L HNO_3	100 mL	207-09151
Tin Standard Solution (Sn: 1,000 mg/L)				
	JCSS	Sn in 3 mol/L HCl	100 mL	202-16311

Description	Grade	Note	Pkg. Size	Wako Cat. No.
Titanium Standard Solution (Ti: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Ti(SO_4)_2$ in 1 mol/L H_2SO_4	100 mL	209-06171
Tungsten Standard Solution (W: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	Na_2WO_4 in H_2O	100 mL	203-08151
Vanadium Standard Solution (V: 1,000 mg/L))				
	JCSS	V in 0.2 mol/L HCl 0.5 mol/L HNO_3	100 mL	221-01851
Ytterbium Standard Solution (Yb: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Yb(NO_3)_3$ in 1 mol/L HNO_3	100 mL	257-00131
Yttrium Standard Solution (Y: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$Y(NO_3)_3$ in 1 mol/L HNO_3	100 mL	250-00121
Zinc Standard Solution (Zn: 100 mg/L)				
	JCSS	$Zn(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	261-01431
Zinc Standard Solution (Zn: 1,000 mg/L)				
	JCSS	$Zn(NO_3)_2$ in 0.1 mol/L HNO_3	100 mL	264-01421
Zirconium Standard Solution (Zr: 1,000 mg/L)				
	for Atomic Absorption Spectrochemical Analysis,	$ZrO(NO_3)_2$ in 1 mol/L HNO_3	100 mL	263-00891

3. Multielement Standard Solutions for ICP Analysis

These products are mixed reference standards for trace elements analysis by ICP (Inductively Coupled Plasma).

<Analysis for Bioelements>

Multielement Standard Solution, BM

for ICP Analysis		50 mL	132-11481
Mixture of elemental species (mg/L in 1 mol/L HNO_3)	Al: 1,000; Cu: 100; Fe: 1,000; Mn: 100; Pb: 100; Zn: 1,000		

<Analysis for Rock and Solid Elements>

Multielement Standard Solution, L-I

for ICP Analysis		50 mL	138-11461
Mixture of elemental species (mg/L in 1 mol/L HNO_3)	Al:1,000; Ba:100; Ca:1,000; Cr:100; Fe:1,000; Mg:100; Pb:100; Sr:100		

Multielement Standard Solution, L-II

for ICP Analysis		50 mL	135-11471
Mixture of elemental species (mg/L in 1 mol/L H_2SO_4)	Cu: 100; Mn: 100; Ni: 100; V: 100; Zn: 100		

Analysis for Rare Earth Elements

Multielement Standard Solution, R-I

for ICP Analysis		50 mL	137-11431
Mixture of elemental species (mg/L in 1 mol/L HNO_3)	Ce: 100; La: 100; Pr: 100; Sc: 100; Y: 100		

Multielement Standard Solution, R-II

for ICP Analysis		50 mL	134-11441
Mixture of elemental species (mg/L in 1 mol/L HNO_3)	Eu: 100; Gd: 100; Nd: 100; Sm: 100; Tb: 100		

Multielement Standard Solution, R-III

for ICP Analysis		50 mL	131-11451
Mixture of elemental species (mg/L in 1 mol/L HNO_3)	Dy: 100; Er: 100; Ho: 100; Lu: 100; Tm: 100; Yb: 100		

<Water Quality Analysis>

Multielement Standard Solution, W-I

for ICP Analysis		50 mL	139-11491
Mixture of elemental species (mg/L in H_2O)	K: 2,000; Na: 2,000; P: 1,000		

Multielement Standard Solution, W-II

for ICP Analysis		50 mL	132-11501
Mixture of elemental species (mg/L in 1 mol/L HNO_3)	Ca: 1,000; Co: 100; Fe: 100; Mg: 1,000; Mn: 100; Ni: 100		

Multielement Standard Solution, W-III

for ICP Analysis		50 mL	139-11511
Mixture of elemental species (mg/in 1 mol/L HNO_3)	Cd: 100; Cr: 100; Cu: 1,000; Pb: 100; Zn: 1,000		

Multielement Standard Solution, W-IV

for ICP Analysis		50 mL	139-11871
Mixture of elemental species (mg/L in 0.1 mol/L HNO_3)	Cd:100; Cr:100; Cu:100; Fe:100; Mn:100; Na:100; Pb:100; Zn:10(		

Multielement Standard Solution, W-V

for ICP Analysis		50 mL	138-13781
Mixture of elemental species (mg/L in 1 mol/L NH_4NO_3)	Al: 100; B: 100; Cd: 100; Cr: 100; Cu: 100; Fe: 100; Mn: 100; Mo: 100; Na: 100; Ni: 100; Pb: 100; Zn: 100		

Multielement Standard Solution, W-VI

for ICP Analysis		50 mL	139-14551
Mixture of elemental species (mg/L in 0.1 mol/L HNO_3)	Al: 100; B: 100; Ca: 100; Cd: 100; Cr: 100; Cu: 100; Fe: 100; Mg: 100; Mn: 100; Na: 100; Pb: 100; Zn: 100		

Multielement Standard Solution W-X

ICP-MS Analysis		50 mL	134-16201
Mixture of elemental species (mg/L in 0.2 mol/L HNO_3)	Cd: 100; Cr: 100; Se: 100; Pb: 100; As: 100; Zn: 100; Al: 100; Cu: 100; Mn: 100		

Description	Grade	Note	Pkg. Size	Wako Cat. No.	

4. Reagents for Analysis of Poisonous Metals

Hg, Cd, Pb, As and other poisonous metals as environmental pollutants are measured at the ppb level by increased sensitivity of atomic absorption spectrometer, ICP emission spectral analysis/ICP mass spectroscope, etc. Reagents for analysis of poisonous metals are reagents with impurity metal content reduced to the maximum as reagents which are measured against these poisonous metals.

Ammonia Solution, 25 - 27.9% (NH_3)				
	for Analysis of Poisonous Metals	500 mL	013-08455	
Hydrochloric Acid, 35 - 37% (Ti)				
	for Analysis of Poisonous Metals	500 mL	081-03475	
	JIS ; for Arsenic Analysis	500 mL	084-01086	
Hydroxylammonium Chloride, 97.0+ % (Ti)				
	for Analysis of Poisonous Metals	25 g 100 g	083-03452 085-03451	
Nitric Acid, 60 - 62% (Ti)				
	for Analysis of Poisonous Metals	500 mL	140-04016	*1
Potassium Peroxodisulfate, 97.0+% (Ti)				
	for Analysis of Poisonous Metals	500 g	164-09175	
Sulfuric Acid, 96～98% (Ti)				
	for Analysis of Poisonous Metals	500 g	199-07325	
Tin (II) Chloride Dihydrate, 96.0+% (Ti)				
	for Analysis of Poisonous Metals	25 g 100 g	204-06682 206-06681	

E. Super Special Grade Reagents (S.S.G)

Super special grade (S.S.G.) reagents are reagents with the highest quality standard guaranteed for which specification parameters and specification values of JIS special grade or higher are specified.

Acetic Acid, 99.9+ % (Ti)				
	S.S.G.	500 mL 3 L	012-00245 010-00241	
Ammonia Solution, 25 - 27.9 % (NH_3)				
	S.S.G.	500 mL	018-05105	
Benzene, 99.8+ % (cGC)				
	S.S.G.	500 mL	021-06615	
Benzyl Alcohol, 99.5+ % (cGC)				
	S.S.G.	1 kg	028-06201	
Cyclohexane, 99.8+ % (cGC)				
	S.S.G.	500 mL	031-06895	
Ethanol (99.5), 99.5 v/v%				
	S.S.G.	500 mL	050-00446	
Hexaammonium Heptamolybdate Tetrahydrate, 99.0+ % (Ti)				
	S.S.G. Crystals	100 g	018-08961	
	S.S.G. Powder	100 g	017-10761	
Hydrochloric Acid, 35 - 37 %				
	S.S.G.	500 mL	083-03435	
20% Hydrochloric Acid, 20 - 21 % (Ti)				
	S.S.G. (constant boiling point; not including iror	500 mL	088-01805	
Hydrogen Peroxide, abt. 30%				
	S.S.G.	100 mL 500 mL	084-07441 086-07445	
Methanol, 99.8+ % (cGC)				
	S.S.G.	500 mL	136-09475	
Nitric Acid, 60 - 62 % (Ti)				
	S.S.G.	500 mL	149-02886	*2
50 w/w% Potassium Hydroxide Solution				
	S.S.G.	500 mL	168-20455	
2-Propanol, 99.9+ % (cGC)				
	S.S.G.	500 mL	164-08335	
50% Sodium Hydroxide Solution				
	S.S.G.	100 mL 500 mL	195-12371 197-12375	
Sulfuric Acid, 96 - 98 % (Ti)				
	S.S.G.	500 g	190-04675	
1.0 mol/L Tetrabutylammonium Hydroxide Solution				
	S.S.G.	100 mL 500 mL	206-15231 208-15235	
25% Tetramethylammonium Hydroxide Solution				
	S.S.G.	500 mL	206-15035	
Tin (II) Chloride Dihydrate, 97+ % (Ti)				
	S.S.G.	500 g	201-06675	

Description	Grade	Note	Pkg. Size	Wako Cat. No.	

F. Reagents for Ultratrace Analysis

◆Each product guarantees the content of various metallic impurities at the ppt level.
◆In order to maintain the ppt-level quality for using fluororesin (PFA) containers (extra-pure water uses high-density polyethylene containers), PFA containers thoroughly cleaned before filling is used.
◆Double plastic bag packing used: Because single plastic bag (inside) packing is performed in the clean room, the reagents are able to be carried into the clean room as it is.
◆Inspection report attached: Impurity metal analysis by ICP-MS and FL-AAS is performed, and the analysis results are attached to the product.

Hydrochloric Acid, 35 - 37%				
	for Ultratrace Analysis	500 mL	089-07555	
Nitric Acid , 69 - 70% (Ti)				
	for Ultratrace Analysis	500 mL	148-06935	*2
Sulfuric Acid, 95+% (Ti)				
	for Ultratrace Analysis	500 mL	198-11825	
Ultrapure Water				
	for Ultratrace Analysis	1 L	217-01031	

G. Highly-Pure Reagents for Electronic Industries

High-purity organic solvents and acids (semiconductor (SC) grade) for electronic industry.
They are applicable to semicondenser field and have low contents of particles and metal impurities.

Acetone, 99.7+ % (cGC)				
	SC	1 L	018-23121	
Ethanol (99.5), 99.5+ % (cGC)				
	SC	1 L	050-08001	
Hydrochloric Acid, 35.0 - 37.0% (Ti)				
	SC	1 kg	089-09331	
Methanol, 99.7+ % (GC)				
	SC	1 L	133-16391	
Nitric Acid, 70 - 71% (Ti)				
	SC	1 kg	143-08881	*2
2-Propanol, 99.9+ % (cGC)				
	SC	1 L	161-25021	
Sulfuric Acid, 96.0+ % (Ti)				
	SC	1 kg	194-15761	*1

H. Infinity Pure Series (∞Pure)

Infinity Pure is a series of reagents characterized by the highest quality and small packaging unit (100 mL). The reagents, particularly those in the biochemical fields such as gene engineering, immunology and cell biology, are required to be highly purified with little secondary contamination after opening the package. This product is available in the package of 100 mL minimizing unused waste and it is a personal reagent with a space for recording the opening date, user name, *etc*. in the label.

Acetone, 99.8+ % (cGC)				
	∞Pure	100 mL	014-14811	
Acetonitrile, 99.8+ % (cGC)				
	∞Pure	100 mL	011-14821	
Benzene, 99.7+ % (cGC)				
	∞Pure	100 mL	021-12301	
Chloroform, 99.7+ % (cGC)(except ethanol containing as the stabilizer)				
	∞Pure	100 mL	033-15721	
Dichloromethane, 99.5+ % (cGC)(except methanol containing as the stabilizer)				
	∞Pure	100 mL	042-24521	
Diethyl Ether, 99.5+ % (cGC)				
	∞Pure	100 mL	049-24531	
***N,N*-Dimethylformamide**, 99.7+ % (cGC)				
	∞Pure	100 mL	048-24501	
Dimethyl Sulfoxide, 99.5+ % (cGC)				
	∞Pure	100 mL	045-24511	
1,4-Dioxane, 99.7+ % (cGC)				
	∞Pure	100 mL	045-24491	
Ethanol (99.5), 99.5+% (cGC)				
	∞Pure	100 mL	053-06531	
Ethyl Acetate, 99.8+ % (cGC)				
	∞Pure	100 mL	055-05991	
Heptane (*n*-Hexane), 99+ % (cGC)				
	∞Pure	100 mL	089-06891	

Description	Grade	Note	Pkg. Size	Wako Cat. No.
Hexane (*n*-Hexane), 96+ % (cGC)				
	∞Pure		100 mL	082-06901
Methanol, 99.8+ % (cGC)				
	∞Pure		100 mL	134-11821
1-Propanol, 99.7+ % (cGC)				
	∞Pure		100 mL	165-16991
2-Propanol, 99.7+ % (cGC)				
	∞Pure		100 mL	162-17001
Pyridine, 99.5+ % (cGC)				
	∞Pure		100 mL	169-17011
Tetrahydrofuran, Stabilizer Free, 99.8+ % (cGC)				
	∞Pure		100 mL	205-12881
Toluene, 99.8+ % (cGC)				
	∞Pure		100 mL	208-12871

I. Reagents for Alkaline Analysis

A highly purified product for alkalis analysis minimizing the contents of Na, K and other impurities of Mg, Sr, Ba and Fe.

Calcium Carbonate, 99.5+ % (Ti)			
for Alkaline Analysis		500 g	030-00405

J. Solvents for Absorptiometric Analysis

Chloroform, 99.0+ % (cGC)			
for Absorptiometric Analysis		500 mL	031-05516
Glycerol, 99.0+ % (cGC)			
for Absorptiometric Analysis		250 mL	076-00641
Polyvinyl Alcohol			
for Absorptiometric Analysis		500 g	160-08295
Phenylfluorone			
for Absorptiometric Analysis		1 g 10 g	162-01631 168-01633

K. Solvents for Spectrochemical Analysis

Highly pure solvents guaranteed for low absorption and fluorescent intensity. These solvents are used in various spectrochemical analyses including absorption spectrophotometry.

Acetone, 99.9+ % (cGC)			
for Spectrochemical Analysis		500 mL	014-19095
Acetonitrile, 99.9+ % (cGC)			
for Spectrochemical Analysis		500 mL	017-19105
Benzene, 99.9+ % (cGC)			
for Spectrochemical Analysis		500 mL	027-14525
1-Butanol (*n*-Butanol), 99.7+ % (cGC)			
for Spectrochemical Analysis		500 mL	021-14545
***t*-Butyl Methyl Ether**, 99.9+ % (cGC)			
for Spectrochemical Analysis		500 mL	024-14535
Chloroform, 99.8+ % (cGC)(except ethanol containing as the stabilizer)			
for Spectrochemical Analysis		500 mL	038-18495
Cyclohexane, 99.9+ % (cGC)			
for Spectrochemical Analysis		500 mL	031-18505
Dichloromethane, 99.9+ % (cGC)(except methanol containing as the stabilizer)			
for Spectrochemical Analysis		500 mL	044-28305
***N,N*-Dimethylformamide**, 99.9+ % (cGC)			
for Spectrochemical Analysis		500 mL	048-28325
Dimethyl Sulfoxide, 99.9+ % (cGC)			
for Spectrochemical Analysis		500 mL	045-28335
1,4-Dioxane, 99.8+ % (cGC)			
for Spectrochemical Analysis		500 mL	042-28345
Distilled Water			
for Spectrochemical Analysis		500 mL	049-28355
Ethanol (99.5), 99.5 v/v%			
for Spectrochemical Analysis		500 mL	052-06925
Ethyl Acetate, 99.9+ % (cGC)			
for Spectrochemical Analysis		500 mL	059-06935

Description	Grade	Note	Pkg. Size	Wako Cat. No.
Heptane (*n*-Hexane), 99.3+ % (cGC)				
	for Spectrochemical Analysis		500 mL	080-07845
Hexane (*n*-Hexane), 96+ % (cGC)				
	for Spectrochemical Analysis		500 mL	087-07855
Methanol, 99.9+ % (cGC)				
	for Spectrochemical Analysis		500 mL	139-13995
2-Propanol, 99.9+ % (cGC)				
	for Spectrochemical Analysis		500 mL	169-20485
Tetrahydrofuran, Stabilizer Free, 99.9+ % (cGC)				
	for Spectrochemical Analysis		500 mL	200-15435
Toluene, 99.8+ % (cGC)				
	for Spectrochemical Analysis		500 mL	207-15445
2,2,4-Trimethylpentane, 99.8+ % (cGC)				
	for Spectrochemical Analysis		500 mL	204-15455

L. Reagents for Infrared Analysis

Products with the background of infrared absorption spectrum extremely reduced. Use for IR analysis.

Liquid Paraffin			
for Infrared Spectrophotometry		500 mL	121-04745
Potassium Bromide			
for Infrared Spectrophotometry		50 g	165-17111
Potassium Bromide, Crystal block			
for Infrared Spectrophotometry		100 g	169-16271
Potassium Chloride, 99.0+ % (Ti)			
for Infrared Spectrophotometry		50 g	166-22411

M. Reagent for Fluorometric Analysis <Solvent>

Sodium Sulfate			
for Fluorometric Analysis		500 g	194-07135

N. Reagents for X-ray Fluorometry

Pretreatment agent for samples for fluorescent x-ray analysis. This product and a sample is mixed, dissolved by ignition melting, cooled, and made into glass beads. It has low contents of Cl, SO_4 and metallic impurities, and has a low analytical background. It is easy to use because it is small in volume in a melting crucible (small volume per weight).

Lithium Tetraborate, Granules, 98.0～102.0 % (Ti)			
for X-ray Fluorometry		500 g	123-04065
Lithium Tetraborate, type II, 98.0～102.0 % (Ti)			
for X-ray Fluorometry		500 g	120-04455

This is a reagent of the quality standard suitable to fluorescent X-ray analysis, minimizing the contents of Cl, SO_4 and metals (Mg, Ca, Al, Si, Ti, Mn, Fe). While lithium salts are used in general for preparation of samples for the fluorescent X-ray analysis, this product is a sodium salt not containing lithium. It is used in the fluorescent X-ray analysis of iron ore and ceramic raw materials by the glass beads method.

Sodium Tetraborate, 98.0+ % (Ti)			
for X-ray Fluorometry		1 kg	193-08761

O. Reagents for Liquid Scintillator

Radioisotopes are being applied frequently in all sorts of fields including science, engineering, agriculture, medicine and pharmacology. Of the methods for counting, the low-energy beta ray measurement by an organic scintillator (liquid scintillation counting) is used frequently as an essential method for measurement of 3H, 14C, etc. An organic scintillator is one of the media converting radiation energy to light energy, which is measured as a pulse light by a photomultiplier.

1. Reagent for Liquid Scintillator

2-Aminoethanol, 99.0+ % (cGC)			
for Scintillator		500 mL	050-03785

2. Equipment

The product is a polyester colorless round sheet, and can be inserted into a vial (measurement sample bottle) for liquid scintillation as is simply by bending slightly. (Unlike conventional glass products, crushing is unnecessary. The product has a sterilized hydrophilic surface.

<Plastic Sheet>

Plastic Sheet, Toluene Resisting			
for Tissue Culture	23 mmφ x 0.2 mm thick	50 sheets × 3	160-08893
for Tissue Culture	14 mmφ x 0.2 mm thick	40 sheets × 4	162-09311

Description	Grade	Note	Pkg. Size	Wako Cat. No.

P. Reagents for Elemental Analysis

1. Oxidizing Agents

Cobalt (II, III) Oxide, 90+ % (Ti)

for Elemental Analysis	1.70～3.35 mm (6～10 mesh)	25 g	038-09002
for Elemental Analysis	0.85～2.36 mm (8～20 mesh)	25 g	035-09012

Copper(Ⅱ) Oxide, Granular, 99+ % (Ti)

for Elemental Analysis	710～1180 μm (14～24 mesh)	100 g	036-09461

2. Reducing Agents

Copper, Reduced, Granular

for Elemental Analysis	300～850μm (20～50 mesh)	100 g	036-09961
for Elemental Analysis	180～425μm (40～80 mesh)	100 g	038-11371
for Elemental Analysis	150～250μm (60～100 mesh)	100 g	031-13701

Copper, Reduced, Wire

for Elemental Analysis	(φ 0.4 x 5 mm)	250 g	032-10811
for Elemental Analysis	(φ 0.6 x 5 mm)	100 g	034-11253
for Elemental Analysis	(φ 0.6 x 5 mm)	250 g	038-11251

3. Carbon Dioxide Absorbent

Soda Talc, Dark Blue

for Elemental Analysis	1.70～3.35 mm (6～10 mesh)	50 g	198-09791
for Elemental Analysis	0.71～1.70 mm (10～24 mesh)	50 g	191-09801

Sodium Hydroxide, Granular, Blue, 80.0+ % (Ti)

for Elemental Analysis	1.70～3.35 mm (6～10 mesh)	50 g	194-09771

4. Water Absorbents

Calcium Chloride, 95.0+ % (Ti)

for Elemental Analysis		100 g	034-00501

Magnesium Perchlorate, 83+ % (Ti)

JIS; for Elemental Analysis	1.18 ~ 3.35 mm (6 ~ 14 mesh)	50 g	133-00323
JIS; for Elemental Analysis	1.18 ~ 3.35 mm (6 ~ 14 mesh)	250 g	137-00321
JIS; for Elemental Analysis	710 μm ~ 2.36 mm (8 ~ 24 mesh)	50 g	134-07891
JIS; for Elemental Analysis	710 μm ~ 2.36 mm (8 ~ 24 mesh)	250 g	130-07893
JIS; for Elemental Analysis	300 ~ 850 μm (20 ~ 48 mesh)	50 g	133-07981
JIS; for Elemental Analysis	300 ~ 850 μm (20 ~ 48 mesh)	400 g	139-07983

5. Halogen and Sulfur Dioxide Removers

Silver, Small Granular

for Elemental Analysis	425 ~ 850 μm (20 ~ 35 mesh)	25 g	192-07832

Silver, Wire(0.1 mm), 99.5+ % (Ti)

for Elemental Analysis	(φ 0.1 mm)	25 g	195-07562

Sulfix

for Elemental Analysis	850 ~ 2360 μm (8 ~ 20 mesh)	25 g	194-07912

6. Standard

Acetanilide Standard

for Elemental Analysis		2 g	013-11721

7. Other Reagents for Elemental Analysis

Quartz Granular

for Elemental Analysis	600 ~ 850 μm (20 ~ 28 mesh)	100 g	171-00421

Quartz Wool

for Elemental Analysis	(φ: 1 ~ 6 μ)	1 g	176-00351

Tungsten (VI) Oxide

for Elemental Analysis		25 g	204-07162

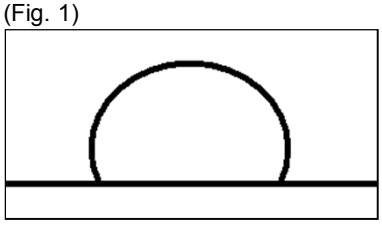
Description	Grade	Note	Pkg. Size	Wako Cat. No.

Q. Wetting Tension Test Mixtures

■ Wetting Tension is …

The ability of plastic films to retain inks, coating, adhesives, *etc*., is primarily dependent on the character of their surfaces, and can be improved by one of several surface-treating techniques. These techniques have been found to increase the wetting tension of a plastic film surface in contact with mixtures of solvents. It is therefore possible to relate the wetting tension of a plastic film surface relates to its ability to accept and retain inks, coatings, adhesives, *etc*.
The condition with water drops placed on the surface is not defined to be wet (Fig. 1). To let the surface get wet with a liquid with strong surface tension as in the case of water, the film surface must have the property to blend into water (high polarity). Conversely, with the solvent with weak surface tension as in the case of organic solvent, the film surface gets wet even if the film surface has a property to repel water.
Consequently, when plastic film is coated with paint, provided with coating, or bonded, it is important to know the wetting tension of plastic film. (Prescribed in JIS K6768.)

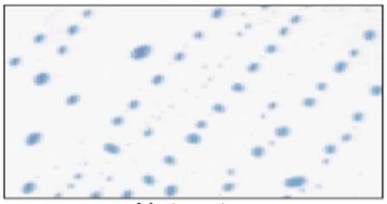
(Fig. 1)



(Fig. 2)

Wet

Not wet



Not wet

■Principle

A series of mixtures of solvents of gradually increasing surface tension are applied to the surface of the plastic film until a mixture is obtained that just wets the film surface. The wetting tension of the surface under test is approximately by the surface tension of this particular mixture.

■Wetting Tension Test Mixture

36 kinds of test mixtures of graduated wetting tension are available for wetting tension test.

■Procedure

A cotton-tipped stick is used for spreading the test mixtures and the liquid shall be spread rapidly over an area of at least 20 cm^2. The quantity of liquid shall be such that it forms a thin film without pools. Impregnate the mixture and apply only one coat to the film in the lateral direction. The amount of the liquid applied exerts great effect on the accuracy of the test, to which care must be taken.

○ In the case of excess application

The liquid film does not break from the film inside but shrinks from the surrounding, and forms a large liquid drop (large measurement value results).

○ In the case of application of an appropriate amount

Breakage of coated liquid film simultaneously occurs not only from the surrounding but also the center part of the film.

○ In the case of application of excessively small amount

In the case of application, breakage of liquid film occurs in the direction where the cotton-tipped stick is moved and application irregularity is formed (small measurement value results).

■**How to determine**

Observe the liquid film of the test mixture under glancing illumination and note the time taken for the continuous liquid film to break up into droplets. If the liquid film holds together for more than 2 seconds, repeat the test on a new specimen with a mixture of the next higher surface tension, until the liquid film breaks up in less than 2 seconds. If the liquid film holds for less than 2 seconds, proceed to lower surface tensions until the film persists for 2 seconds. (Fig. 2)

<Wetting Tension Test Mixture>

Description	Grade	Note	Pkg. Size	Wako Cat. No.
Wetting Tension Test Mixture No. 22.6		(Wetting Tension: 22.6 mN/m)	50 mL	235-01791
Wetting Tension Test Mixture No. 25.4		(Wetting Tension: 25.4 mN/m)	50 mL	238-01801
Wetting Tension Test Mixture No. 27.3		(Wetting Tension: 27.3 mN/m)	50 mL	235-01811
Wetting Tension Test Mixture No. 30.0		(Wetting Tension: 30.0 mN/m)	50 mL	232-01821
Wetting Tension Test Mixture No. 31.0		(Wetting Tension: 31.0 mN/m)	50 mL	239-01831
Wetting Tension Test Mixture No. 32.0		(Wetting Tension: 32.0 mN/m)	50 mL	236-01841
Wetting Tension Test Mixture No. 33.0		(Wetting Tension: 33.0 mN/m)	50 mL	233-01851
Wetting Tension Test Mixture No. 34.0		(Wetting Tension: 34.0 mN/m)	50 mL	230-01861
Wetting Tension Test Mixture No. 35.0		(Wetting Tension: 35.0 mN/m)	50 mL	237-01871
Wetting Tension Test Mixture No. 36.0		(Wetting Tension: 36.0 mN/m)	50 mL	234-01881
Wetting Tension Test Mixture No. 37.0		(Wetting Tension: 37.0 mN/m)	50 mL	231-01891
Wetting Tension Test Mixture No. 38.0		(Wetting Tension: 38.0 mN/m)	50 mL	234-01901
Wetting Tension Test Mixture No. 39.0		(Wetting Tension: 39.0 mN/m)	50 mL	231-01911

Description	Grade	Note	Pkg. Size	Wako Cat. No.
Wetting Tension Test Mixture	**No. 40.0**	(Wetting Tension: 40.0 mN/m)	50 mL	238-01921
Wetting Tension Test Mixture	**No. 41.0**	(Wetting Tension: 41.0 mN/m)	50 mL	235-01931
Wetting Tension Test Mixture	**No. 42.0**	(Wetting Tension: 42.0 mN/m)	50 mL	232-01941
Wetting Tension Test Mixture	**No. 43.0**	(Wetting Tension: 43.0 mN/m)	50 mL	239-01951
Wetting Tension Test Mixture	**No. 44.0**	(Wetting Tension: 44.0 mN/m)	50 mL	236-01961
Wetting Tension Test Mixture	**No. 45.0**	(Wetting Tension: 45.0 mN/m)	50 mL	233-01971
Wetting Tension Test Mixture	**No. 46.0**	(Wetting Tension: 46.0 mN/m)	50 mL	230-01981
Wetting Tension Test Mixture	**No. 48.0**	(Wetting Tension: 48.0 mN/m)	50 mL	237-01991
Wetting Tension Test Mixture	**No. 50.0**	(Wetting Tension: 50.0 mN/m)	50 mL	234-02001
Wetting Tension Test Mixture	**No. 52.0**	(Wetting Tension: 52.0 mN/m)	50 mL	231-02011
Wetting Tension Test Mixture	**No. 54.0**	(Wetting Tension: 54.0 mN/m)	50 mL	238-02021
Wetting Tension Test Mixture	**No. 56.0**	(Wetting Tension: 56.0 mN/m)	50 mL	235-02031
Wetting Tension Test Mixture	**No. 58.0**	(Wetting Tension: 58.0 mN/m)	50 mL	232-02041
Wetting Tension Test Mixture	**No. 59.0**	(Wetting Tension: 59.0 mN/m)	50 mL	239-02051
Wetting Tension Test Mixture	**No. 60.0**	(Wetting Tension: 60.0 mN/m)	50 mL	236-02061
Wetting Tension Test Mixture	**No. 61.0**	(Wetting Tension: 61.0 mN/m)	50 mL	233-02071
Wetting Tension Test Mixture	**No. 62.0**	(Wetting Tension: 62.0 mN/m)	50 mL	230-02081
Wetting Tension Test Mixture	**No. 63.0**	(Wetting Tension: 63.0 mN/m)	50 mL	237-02091
Wetting Tension Test Mixture	**No. 64.0**	(Wetting Tension: 64.0 mN/m)	50 mL	230-02101
Wetting Tension Test Mixture	**No. 65.0**	(Wetting Tension: 65.0 mN/m)	50 mL	237-02111
Wetting Tension Test Mixture	**No. 67.0**	(Wetting Tension: 67.0 mN/m)	50 mL	234-02121
Wetting Tension Test Mixture	**No. 70.0**	(Wetting Tension: 70.0 mN/m)	50 mL	231-02131
Wetting Tension Test Mixture	**No. 73.0**	(Wetting Tension: 73.0 mN/m)	50 mL	238-02141

R. NMIJ* products certified Reference Materials (NMIJ CRM) ＊: National Metrology Institute of Japan

NMIJ CRM is certified reference material supplied by NMIJ (National Metrology Institute of Japan). It is a reference material with the weighing traceability established, and determines the production by the Quality System in accordance with ISO Guide 34 and the certified value based on ISO Guide 35.
Certified Reference Material (CRM): A certified reference material valued by a metrologically adequate procedure with respect to one or more prescribed properties, and having a certification with the values of prescribed properties and their uncertainties, as well as metrological traceability stipulated.
Reference Material (RM): Material prepared to be sufficiently homogeneous and stable for one or more prescribed properties and to be suited for the intended use of the measurement process.

1. Certified Reference Materials of Environmental Composition

Arsenate [As (V)] Solution				
	AIST [*4]	(NMIJ CRM 7912-a)	50 mL	632-16051
Arsenobetaine Solution				
	AIST	(NMIJ CRM 7901-a)	10 mL	631-09671
Organic Pollutants in Japanese Seabass Tissue				
	AIST	(NMIJ CRM 7404-a)	10 g	635-20451
Pesticides in Cabbage				
	AIST	(NMIJ CRM 7508-a)	3 g	636-23161
Pesticides in Green Onion				
	AIST	(NMIJ CRM 7507-a)	3 g	639-23151
Pesticides in Unpolished Rice				
	AIST	(NMIJ CRM 7504-a)	25 g	633-16042
Polycyclic Aromatic Hydrocarbons and Toxic Elements in Tunnel Dust				
	AIST	(NMIJ CRM 7308-a)	1 g	635-23251
Polycyclic Aromatic Hydrocarbons in Fresh Water Lake Sediment				
	AIST	(NMIJ CRM 7307-a)	60 g	636-14511
Trace Elements and Arsenic Compounds in Seaweed (Hijiki)				
	AIST	(NMIJ CRM 7405-a)	20 g	634-21141
Trace Elements in Lake Sediment				
	AIST	(NMIJ CRM7303-a)	60 g	636-05341
Trace Elements in Marine Sediment				
	AIST	(NMIJ CRM7302-a)	60 g	639-05331
Trace Elements in River Water (Elevated Level)				
	AIST	(NMIJ CRM 7202-b)	100 mL	638-12991
Trace Elements in Tea Leaf Powder				
	AIST	(NMIJ CRM 7505-a)	20 g	632-22161
Trace Elements in White Rice Flour Set (Cd Level I & II)				
	AIST	(NMIJ B-4)	1 set	632-14471

*4: National Institute of Advanced Industrial Science and Technology

Description	Grade	Note	Pkg. Size	Wako Cat. No.

2. Certified Reference Materials of Organic Substances

Acetaldehyde				
	AIST	(NMIJ CRM 4054-a)	10 mL	630-20401
Acrylonitrile				
	AIST	(NMIJ CRM 4040-b)	15 mL	639-10101
L-Alanine				
	AIST	(NMIJ CRM 6011-a)	0.5 g	634-22121
L-Arginine				
	AIST	(NMIJ CRM 6017-a)	0.5 g	638-22141
Benzene				
	AIST	(NMIJ CRM 4002-a)	15 mL	630-10011
Benzo [a] pyrene Standard (in 2,2,4-Trimethylpentane Solution)				
	AIST	(NMIJ CRM 4213-a)	1 g	639-11701
Bromodichloromethane				
	AIST	(NMIJ CRM 4020-a)	5 mL	639-11681
Bromoform				
	AIST	(NMIJ CRM 4019-a)	5 mL	632-11671
Cholesterol				
	AIST	(NMIJ CRM 6001-a)	1 g	636-10111
C-Peptide				
	AIST	(NMIJ CRM 6901-a)	10 mL	638-23241
Creatinine				
	AIST	(NMIJ CRM 6005-a)	2 g	631-11761
***p,p′*-DDE in 2,2,4-Trimethylpentane**				
	AIST	(NMIJ CRM4202-a)	1 g	638-05801
Deoxyribonucleic Acid (DNA) Solutions for Quantitative Analysis				
	AIST	(NMIJ CRM 6203-a)	50µl×4	631-23231
Dibromochloromethane				
	AIST	(NMIJ CRM 4036-a)	5 mL	636-11691
***p*-Dichlorobenzene**				
	AIST	(NMIJ CRM 4039-a)	5 g	639-14481
1,1-Dichloroethylene				
	AIST	(NMIJ CRM 4014-a)	15 mL	637-23071
Dichloromethane				
	AIST	(NMIJ CRM 4005-a)	15 mL	630-22101
1,2-Dichloropropane				
	AIST	(NMIJ CRM 4038-a)	15 mL	635-21051
Diethyl Phthalate				
	AIST	(NMIJ CRM 4022-b)	1.5 mL	639-10081
β-Estradiol (17β-Estradiol)				
	AIST	(NMIJ CRM 6004-a)	300 mg	630-21121
Ethanol				
	AIST	(NMIJ CRM 4001-a)	15 mL	633-10001
Ethylbenzene				
	AIST	(NMIJ CRM 4021-a)	15 mL	632-10071
Hydrocortisone				
	AIST	(NMIJ CRM 6007-a)	200 mg	638-16031
L-Isoleucine				
	AIST	(NMIJ CRM 6013-a)	0.5 g	637-20411
4,4'-Isopropylidenediphenol				
	AIST	(NMIJ CRM 4030-a)	1.5 g	636-10091
L-Leucine				
	AIST	(NMIJ CRM 6012-a)	0.5 g	631-22131
L-Lysine Monohydrochloride				
	AIST	(NMIJ CRM 6018-a)	0.5 g	635-22151
Pentadecafluorooctanoic Acid				
	AIST	(NMIJ CRM 4056-a)	4 mL	634-23081
L-Phenylalanine				
	AIST	(NMIJ CRM 6014-a)	0.5 g	634-20421
Polychlorinated Biphenyls in 2,2,4-Trimethylpentane (PCB194)				
	AIST	(NMIJ CRM 4209-a)	1 g	636-13031
Progesterone				
	AIST	(NMIJ CRM 6003-a)	300 mg	632-23141
L-Proline				
	AIST	(NMIJ CRM 6016-a)	0.5 g	634-20661

Description	Grade	Note	Pkg. Size	Wako Cat. No.
Sulfur in Toluene				
	AIST	(NMIJ CRM 4215-a)	5 mL	636-11711
Sulfur in Toluene				
	AIST	(NMIJ CRM 4217-a)	10 mL	637-22111
Sulfur in Toluene (Blank)				
	AIST	(NMIJ RM 4216-a)	30 mL	631-20671
Urea				
	AIST	(NMIJ CRM 6006-a)	10 g	636-14491
Uric Acid				
	AIST	(NMIJ CRM 6008-a)	2 g	637-21131
L-Valine				
	AIST	(NMIJ CRM 6015-a)	0.5 g	631-20431
***o*-Xylene**				
	AIST	(NMIJ CRM 4011-a)	15 mL	631-10041
***m*-Xylene**				
	AIST	(NMIJ CRM 4012-a)	15 mL	638-10051
***p*-Xylene**				
	AIST	(NMIJ CRM 4013-a)	15 mL	635-10061

3. Certified Reference Materials for Electron Probe Micro Analyzer (EPMA)

Carbon Steel for EPMA Set (C 0.1%, 0.2%, 0.3%, 0.5%, 0.7%)				
	AIST	(NMIJA-3)	1 set	636-05961
Fe-Cr alloy Reference Material Set (Cr 5%, 15%, 20%, 30%, 40%)				
	AIST	(NMIJ A-1)	1 set	632-05941
Fe-Ni alloy Reference Material Set (Ni 5%, 10%, 20%, 40%, 60%)				
	AIST	(NMIJ A-2)	1 set	639-05951
High Nickel Alloy for EPMA				
	AIST	(NMIJ CRM 1020-a)	1 piece	637-20651
Ni (36%)-Fe Alloy for EPMA				
	AIST	(NMIJ CRM 1018-a)	1 piece	635-11661
Ni(42%)-Fe Alloy for EPMA				
	AIST	(NMIJ CRM 1019-a)	1 piece	630-20381
Stainless Steel for EPMA				
	AIST	(NMIJ CRM 1017-a)	1 piece	638-11651

4. Certified Reference Materials

Fine Alumina Powder for Fine Ceramics-**High Purity**				
	AIST	(NMIJ CRM 8007-a)	50 g	638-21161
Fine Alumina Powder for Fine Ceramics-**Low Purity**				
	AIST	(NMIJ CRM 8006-a)	50 g	631-21151
Fine Silicon Carbide Powder for Fine Ceramics **(α phase)**				
	AIST	(NMIJ CRM8001-a)	50 g	634-05761
Fine Silicon Carbide Powder for Fine Ceramics **(β phase)**				
	AIST	(NMIJ CRM8002-a)	50 g	631-05771
Fine Silicon Nitride Powder for Fine Ceramics **(Direct Nitridation) I**				
	AIST	(NMIJ CRM 8003-a)	25 g	631-14522
Fine Silicon Nitride Powder for Fine Ceramics **(Direct Nitridation) II**				
	AIST	(NMIJ CRM 8004-a)	25 g	636-11772
Fine Silicon Nitride Powder for Fine Ceramics **(Liquid Interfacial Reaction)**				
	AIST	(NMIJ CRM 8005-a)	25 g	638-14532
GaAs/AlAs Super Lattice				
	AIST	(NMIJ CRM 5203-a)	1 piece	630-11731
Iron-Chromium Alloy (Cr 40%)				
	AIST	(NMIJ CRM1016-a)	1 piece	637-05511
Low Energy Arsenic Implanted Silicon				
	AIST	(NMIJ CRM 5603-a)	1 sheet	633-21111
Low Energy Arsenic Implanted Silicon (Level: 6×10^{14} atoms/cm^2)				
	AIST	(NMIJ CRM 5604-a)	1 sheet	631-23091
Polycarbonate for Positron Hole-size Measurements				
	AIST	(NMIJ CRM 5602-a)	2 sheets	631-16021
Polystyrene Latex Nanoparticle, 120 nm				
	AIST	(NMIJ CRM 5701-a)	10 mL	634-23101
Quartz Glass for Positron Hole-size Measurements				
	AIST	(NMIJ CRM 5601-a)	2 sheets	634-11751
Silicon Dioxide/Silicon Multilayer Film Reference Material				
	AIST	(NMIJ CRM5202-a)	1 piece	637-05751

Description	Grade	Note	Pkg. Size	Wako Cat. No.

5. Reference Materials of Polymers

Poly(ethylene glycol) 400				
	AIST	(NMIJ CRM 5005-a)	1 g	632-09961
Poly(ethylene glycol) 1,000				
	AIST	(NMIJ CRM 5006-a)	1 g	639-09971
Poly(ethylene glycol) 1,500				
	AIST	(NMIJ CRM 5007-a)	1 g	636-09981
Poly(ethylene glycol) Nonylphenyl Ether				
	AIST	(NMIJ CRM 5010-a)	1 g	636-21101
Polystyrene 500				
	AIST	(NMIJ CRM5002-a)	0.4 g	631-05531
Polystyrene 1000				
	AIST	(NMIJ CRM 5004-a)	0.5 g	635-07871
Polystyrene 2400				
	AIST	(NMIJ CRM5001-a)	0.2 g	634-05521
Polystyrene (Polydisperse)				
	AIST	(NMIJ CRM 5008-a)	5 g	633-11721
Polystyrene 8,500				
	AIST	(NMIJ RM 5009-a)	0.3 g	630-23181

6. Certified Reference Materials of Highly Purified Inorganic Substances

Amidosulfuric Acid				
	AIST	(NMIJ CRM 3004-a)	25 g	635-16002
Arsenic (III) Trioxide				
	AIST	(NMIJ CRM 3003-a)	10 g	638-15992
Potassium Dichromate				
	AIST	(NMIJ CRM 3002-a)	50 g	637-20391
Potassium Hydrogen Phthalate				
	AIST	(NMIJCRM3001-B)	50 g	638-05541
Potassium Iodate				
	AIST	(NMIJ CRM 3006-a)	25 g	631-21352
Sodium Carbonate				
	AIST	(NMIJ CRM 3005-a)	50 g	634-16011
Sodium Oxalate				
	AIST	(NMIJ CRM 3007-a)	50 g	630-23061

7. Certified Reference Materials of Green Procurement

Heavy Metals (Cd, Cr, Pb) in ABS Resin-Low Concentration Pellet				
	AIST	(NMIJ CRM 8102-a)	25 g	630-07382
Heavy Metals (Cd, Cr, Pb) in ABS Resin-High Concentration Pellet				
	AIST	(NMIJ CRM 8103-a)	25 g	637-07392
Heavy Metals (Cd, Cr, Pb) in ABS Resin-Low Concentration Disk				
	AIST	(NMIJ CRM 8105-a)	1 sheet	633-10121
Lead-Free Solder Chip (Sn 96.5; Ag 3; Cu 0.5)-Pb High Concentration				
	AIST	(NMIJ CRM 8203-a)	50 g	632-20461
Polybrominated Diphenyl Ethers in Polystyrene				
	AIST	(NMIJ CRM 8108-a)	10 sheets	633-09991
Polybrominated Diphenyl Ethers in Polystyrene (High Concentration) (Contained: 5 sheets; Non-contained: 2 sheets)				
	AIST	(NMIJ CRM 8110-a)	7 sheets	637-14541
Polybrominated Diphenyl Ethers in Poly (Vinyl Chloride) Resin (contained: 1 sheet; non-contained: 1 sheet)				
	AIST	(NMIJ CRM 8109-a)	2 sheets	639-16061

8. Physics Reference Materials

Isotropic Graphite for Thermal Diffusivity Measurement				
	AIST	(NMIJ CRM 5804-a)	4 sheets	639-22171
Reference Material for Thermal Conductivity (Isotropic Graphite), 300 - 900 K				
	AIST	(NMIJ RM 1401-a)	1 set	634-21381
Reference Material for Thermal Expansion (Glass-like Carbon), 293.15 - 1,600 K				
	AIST	(NMIJ RM 1104-a)	1 piece	630-21361
Reference Material of Thermal Expansivity (Glass-like Carbon), 293.15 - 1,100 K, 10 x 6 x 6 mm				
	AIST	(NMIJ RM1102-a-S)		635-14461
Reference Material of Thermal Expansivity (Glass-like Carbon), 293.15 - 1,100 K, 20 x 6 x 6 mm				
	AIST	(NMIJ RM1102-a-L)	1 piece	638-14451

Description	Grade	Note	Pkg. Size	Wako Cat. No.	
Reference Material of Thermal Expansivity (Single Crystal of Silicon), 293.15 - 1,000 K, 60 x 4.5 x 4.5 mm					
	AIST	(NMIJ RM1101-a-S)	1 piece	630-14391	
Reference Material of Thermal Expansivity (Single Crystal of Silicon), 293.15 - 1000 K, 60 x 9 x 9 mm					
	AIST	(NMIJ RM1101-a-L)	1 piece	633-14381	
Reference Thin Film for Heat Diffusion Time Across a Thickness (Titanium Nitride Thin film/Synthetic Quartz Substrate)					
	AIST	(NMIJ RM 1301-a)	1 piece	637-21371	
Single-Crystal of Silicon for Specific Heat Capacity Measurements (at Cryogenic Temperature)					
	AIST	(NMIJ CRM 5806-a)	1 sheet	635-23131	
Single-Crystal of Silicon for Thermal Expansivity Measurements (at Cryogenic Temperature), 10 x 10 x 30 mm					
	AIST	(NMIJ CRM 5803-a(1))	1 sheet	631-23111	
Single-Crystal of Silicon for Thermal Expansivity Measurements (at Cryogenic Temperature), 10 x 10 x 60 mm					
	AIST	(NMIJ CRM 5803-a(2))	1 sheet	638-23121	

S. Analysis for Plastic Antioxidizing Agents

***n*-Octadecyl 3-(3',5'-Di-*t*-butyl-4'-hydroxylphenyl)propionate Standard**, 98+ % (HPLC)				
	for Plastics Antioxidant Test		100 mg	151-02021
Pentaerythritol Tetrakis[3-(3',5'-di-*t*-butyl-4'-hydroxyphenyl)propionate] Standard, 98+ % (HPLC)				
	for Plastics Antioxidant Test		100 mg	166-19101
1,3,5-Trimethyl-2,4,6-tris(3',5'-di-*t*-butyl-4'-hydroxybenzyl)benzene Standard, 98+ % (HPLC)				
	for Plastics Antioxidant Test		100 mg	200-13931
Tris(2,4-di-*t*-butylphenyl) Phosphite Standard, 98+ % (HPLC)				
	for Plastics Antioxidant Tes		100 mg	207-13941

T. Reagents for Fingerprint Detection

Latent fingerprints on some kinds of thermal paper such as train tickets can be clearly detected without damaging the thermal paper using this reagent.

***O*-(3,5,5-Trimethyl-1-hexyl)ninhydrin**, 98+ % (HPLC)				
	for Fingerprint Detection		1 g	200-11971
			10 g	208-11972
			50 g	206-11973

U. Reagents for Oil Analysis

Tetrachloroethylene, 99+ % (cGC)				
	for Oil Analysis		500 mL	203-16765

V. Reagents for Petroleum Product Analysis

Aniline, 99+ % (cGC)				
	for Aniline Point Test		12 mL x 5	010-07441
			100 mL	016-07443
Doctor Solution				
	for Aviation Fuels of Petroleum Product Analysis		100 mL	040-27501
			500 mL	042-27505
0.1 mol/L Hydrochloric Acid 2-Propanolic Solution				
	for Neutralization Value Determination in Petroleum Produ		500 mL	081-07375

★ Related Products ★

Decahydronaphthalene(mixture of *cis*-and *trans*-), 99+ % (cGC)(mixture of isomers)				
	for Analysis of Sulfur in Petroleum Produc		1 L	044-18611
0.1 mol/L Potassium Hydroxide 2-Propanolic Solution (N/10)				
	for Neutralization Value Determination in Petroleum Produc		500 mL	165-09345
1,2,3,4-Tetrahydronaphthalene, 98+ % (cGC)				
	for Analysis of Sulfur in Petroleum Product		1 L	204-07961
Titration Solvent A				
	for Neutralization Value Determination in Petroleum Produc		3 L	201-13221
Titration Solvent B				
	for Neutralization Value Determination in Petroleum Produc		3 L	208-13231
Titration Solvent B-II				
	for Neutralization Value Determination in Petroleum Produc		3 L	202-13751 *1

Description	Grade	Note	Pkg. Size	Wako Cat. No.	

W. Reagents for Boron Determination

Each product is used in the preparation of a sample solution in JIS G1227 "Quantitative determination of boron in iron and steel".

Curcumin				
	for Boron Determinatior	1 g	034-11091	
Hydrochloric Acid, 35.0 ~ 37.0% (Ti)				
	for Boron Determination	100 mL 500 mL	083-05191 085-05195	
Methanol, 99.7+ % (cGC)				
	for Boron Determinatior	1 L	131-08141	
Nitric Acid, 60 ~ 61% (Ti)				
	for Boron Determinatior	500 mL	140-05415	*2
Phosphoric Acid, 85.0+ % (Ti)				
	for Boron Determinatior	500 mL	161-12216	
Sulfuric Acid, 95.0+ % (Ti)				
	for Boron Determinatior	500 mL	198-09355	

★ Related Products ★

4-Amino-3-hydrazino-5-mercapto-1,2,4-triazole			
for Aldehyde Determination	5 g 25 g	011-08331 019-08332	*1 *1
2-(5-Bromo-2-pyridylazo)-5-[N-n-propyl-N-(3-sulfopropyl)amino]aniline Sodium Salt (Dojindo: B027)			
Dojindo	100 mg	343-04921	
1,5-Diphenylcarbonohydrazide			
for Chromium (VI) Analysis	5 g 25 g	046-18431 044-18432	
3-Methyl-2-benzothiazolinone Hydrazone Hydrochloride Monohydrate			
for Aldehyde Determination	1 g 25 g	137-03981 135-03982	
Phenylfluorone			
for Absorptiometric Analysis	1 g 10 g	162-01631 168-01633	
Zinc Porphyrin Dimer, 95+% (TLC)			
for CD	20 mg	267-01651	

X. CSK Standard Solutions for Analysis for Nutrient Salts in Seawater

Each solution is a standard solution prepared in response to the request from the International Cooperative Study of the Kuroshio and Adjacent Regions (CSK). CSK standard solutions were shared marine samples prepared to achieve the integrity of analysis of nutrient salts in seawater. No preservative is contained but the solutions are sterilized.

CSK Standard Solution Nitrate (contains 3.05% NaCl)				
for Brine Nutrient Salt Analysis	N: 0.00 µg atom/L	50 mL	039-10181	
for Brine Nutrient Salt Analysis	N: 5.00 µg atom/L	50 mL	036-10191	
for Brine Nutrient Salt Analysis	N: 10.0 µg atom/L	50 mL	039-10201	
for Brine Nutrient Salt Analysis	N: 20.0 µg atom/L	50 mL	033-10221	
for Brine Nutrient Salt Analysis	N: 40.0 µg atom/L	50 mL	037-10241	
CSK Standard Solution Nitrite				
for Brine Nutrient Salt Analysis	N: 0.00 µg atom/L	50 mL	034-10131	
for Brine Nutrient Salt Analysis	N: 0.50 µg atom/L	50 mL	038-10151	
for Brine Nutrient Salt Analysis	N: 1.00 µg atom/L	50 mL	035-10161	
for Brine Nutrient Salt Analysis	N: 2.00 µg atom/L	50 mL	032-10171	
CSK Standard Solution Phosphate (contains 3.05% NaCl)				
for Brine Nutrient Salt Analysis	P: 0.00 µg atom/L	50 mL	037-10001	
for Brine Nutrient Salt Analysis	P: 0.50 µg atom/L	50 mL	034-10011	
for Brine Nutrient Salt Analysis	P: 1.00 µg atom/L	50 mL	031-10021	
for Brine Nutrient Salt Analysis	P: 2.00 µg atom/L	50 mL	038-10031	
for Brine Nutrient Salt Analysis	P: 3.00 µg atom/L	50 mL	035-10041	
CSK Standard Solution Potassium Iodate (0.0100 N)				
for Brine Nutrient Salt Analysis		300 mL	034-10251	
CSK Standard Solution Silicate (contains 3.05 % NaCl)				
for Brine Nutrient Salt Analysis	Si: 0.0 µg atom/L	50 mL	032-10051	
for Brine Nutrient Salt Analysis	Si: 5.0 µg atom/L	50 mL	039-10061	
for Brine Nutrient Salt Analysis	Si: 10.0 µg atom/L	50 mL	036-10071	
for Brine Nutrient Salt Analysis	Si: 50 µg atom/L	50 mL	030-10091	
for Brine Nutrient Salt Analysis	Si: 100 µg atom/L	50 mL	033-10101	
for Brine Nutrient Salt Analysis	Si: 200 µg atom/L	50 mL	037-10121	

Description	Grade	Note	Pkg. Size	Wako Cat. No.	

Y. Reagents for Household Articles Test

Bis (2,3-dibromopropyl) phosphate, 90.0+% (Ti); 90.0+% (GC)

for Household Articles Test		1 g	021-15101	

Dimethyl Fumarate Standard, 99+ % (cGC)

for Household Articles Test		100 mg	041-31061	

1,1,1,2-Tetrachloroethane Standard Solution (1.2 mg/mL Hexane Solution)

for Household Articles Test		10 mL	202-08481	

Tetrachloroethylene Standard Solution (1 mg/mL in Hexane)

for Household Articles Test		10 mL	205-08471	

Trichloroethylene Standard Solution (1 mg/mL in Hexane)

for Household Articles Tes		10 mL	208-08461	

Z. Reagents for Synthetic Detergents Test for Laundering

Optical Whitening Agent

for Synthetic Detergents Test for Laundering		5 g	151-01041	

Sodium linear-Alkylbenzenesulfonate, 95.0+ % (Ti)

for Synthetic Detergents Test for Laundering		25 g	195-07682	

Zeolite, Synthetic, A-4 (Average Particle Size 2 ~ 5 μm)

for Synthetic Detergents Test for Laundering		25 g	268-01522	

AA. Reagents for Residual Solvents Analysis

Highly pure solvents that hardly contains low-boiling point compounds detectable by gas chromatography.

***N,N*-Dimethylacetamide**

for Residual Solvents Analysis		500 mL	043-31565	
		3 L	041-31561	

***N,N*-Dimethylformamide**

for Residual Solvents Analysis		500 mL	046-31555	
		3 L	044-31551	*1

AB. Reagent for Salt Analysis in Hardened Concrete

This product is used for quantitative determination of total salts (silver chromate-absorption spectrometry, silver nitrate titration) contained in hardened concrete.

Calcium Carbonate, 99.5+ % (Ti)

for Salt Analysis	036-12651	250 g		

AC. Others

Dibutyl Disulfide, 98.5+ % (GC)

for Analysis of Sulfur Content by Energy Dispersive X-ray Fluorescence Metho	048-26402	25 mL		

2,4-Dinitrotoluene Standard, 99.5+ % (cGC)

for Thermal Analysis	049-21971	1 g		

90% Nitric Acid, 89.5 - 90.5 % (Ti)

for Test of Dangerous Article Burning	144-05871	100 g	*2	
	146-05875	500 g	*2	

*1: Sea only.

*2: Air cargo only. PAX and sea freight are not acceptable.

*3: Air cargo and Sea only. PAX are not acceptable.

*4: National Institute of Advanced Industrial Science and Technology (p. 26~29)

・Listed products are intended for laboratory research use only, and not to be used for drug, food or human.
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Wako Pure Chemical Industries, Ltd.
http://www.wako-chem.co.jp
1-2, Doshomachi 3-Chome
Chuo-Ku, Osaka 540-8605, Japan
Tel: 81-6-6203-3741
Fax: 81-6-6203-1999

Wako Chemicals USA, Inc.
http://www.wakousa. com
Toll-Free (U.S. only): 1-877-714-1920
Head Office (Richmond, VA):
Tel: 1-804-714-1920/ Fax: 1-804-271-7791
Los Angeles Sales Office (Irvine, CA):
Tel: 1-949-679-1700 / Fax: 1-949-679-1701
Boston Sales Office (Cambridge, MA):
Tel: 1-617-354-6772 / Fax: 1-617-354-6774

Wako Chemicals GmbH
http://www.wako-chemicals.de
European Office:
Fuggerstraße 12, D-41468
Neuss, Germany
Tel: 49-2131-311-0
Fax: 49-2131-311100