

Wako Product Update

ANALYTICAL CHEMISTRY

Please visit the Wako Online Catalog
<http://search.wako-chem.com>

Wako

ENVIRONMENTAL ANALYSIS

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 - Decane (048-28543, 042-28541)
 - Ethanol (99.5) (056-06663, 050-06661)
 - Nonane (148-07351, 142-07354)
 - Petroleum ether (160-20231)
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 - Alkyl Ethoxylate (AE) ELISA Kit (300-08251)
 - AP (Alkylphenol) ELISA Kit (302-08691)
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- Wakopak® Fluofix
- Wakopak® Combi CN

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- Tetra-*n*-butylammonium Phosphate Soln. (207-13701)
- 1-Pentanesulfonic Acid Sodium Salt Soln. (169-18231)
- 1-Hexanesulfonic Acid Sodium Salt Soln. (086-07141)
- 1-Heptanesulfonic Acid Sodium Salt Soln. (083-07151)
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A. Environmental Analysis Standards..... 19

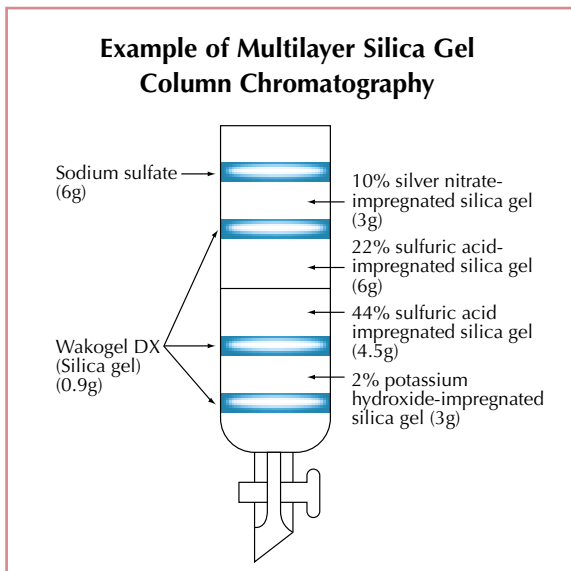
- Copper Pyrithione Standard (039-17881)
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- Tributyltin (IV) Chloride Standard (209-15461)
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A. Multilayer Silica Gel Column for Sample cleanup

In analysis of exhaust gases and dioxins in soil, multilayer silica gel column chromatography is used for sample cleanup. The Following lineup enables you to prepare it easily.



[Product List]

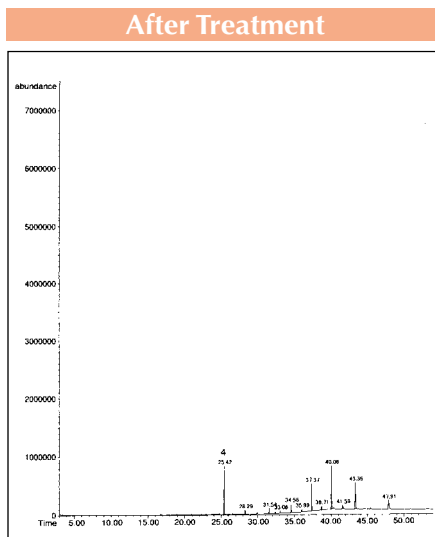
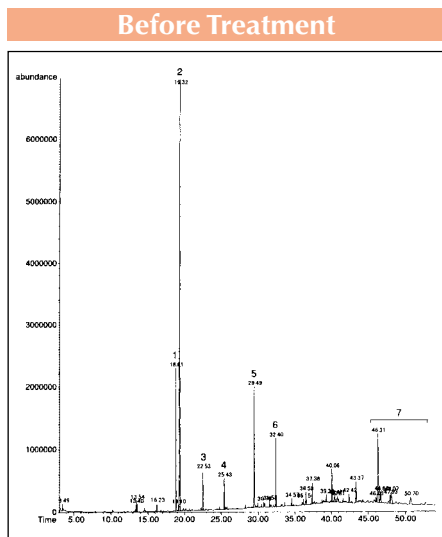
Cat. No. (Pack. Size)	Product
238-01781 (100 g)	Wakogel DX (Silica Gel)
194-12221 (250 g)	Sodium Sulfate
167-19251 (100 g)	2% Potassium Hydroxide-Impregnated Silica Gel
197-11611 (100 g)	10% Silver Nitrate-Impregnated Silica Gel
191-11631 (100 g)	44% Sulfuric Acid-Impregnated Silica Gel
194-11621 (100 g)	22% Sulfuric Acid-Impregnated Silica Gel
<Solvents>	
010-17831 (1 L)	Acetone
016-17833 (3 L)	
048-28543 (5 v × 2 mL)	Decane
042-28541 (100 mL)	
048-26321 (1 L)	Dichloromethane
044-26323 (3 L)	
049-27451 (1 L)	Diethylether
050-06661 (1 L)	Ethanol (99.5)
056-06663 (3 L)	
083-07391 (1 L)	n-Hexane
089-07393 (3 L)	
136-13461 (1 L)	Methanol
132-13463 (3 L)	
148-07351 (5 v × 2 mL)	Nonane
142-07354 (100 mL)	
160-20231 (1 L)	Petroleum ether
203-14141 (1 L)	Toluene
209-14143 (3 L)	

[Guaranteed Specifications]

		Wakogel DX 238-01781 (100g)	Sodium Sulfate 194-12221 (250g)	Nonane 148-07351(5v × 2mL) 142-07354 (100mL)	Decane 048-28543 (5v × 2mL) 042-28541 (100mL)
Dioxins	4-6 Chlorinated comp.	5 pg/10g	1 pg/10g	5 ppt	10 ppt
	7-8 Chlorinated comp.	10 pg/10g	5 pg/10g	10 ppt	50 ppt
Dibenzofuran	4-6 Chlorinated comp.	5 pg/10g	1 pg/10g	5 ppt	10 ppt
	7-8 Chlorinated comp.	10 pg/10g	5 pg/10g	10 ppt	50 ppt
Coplanar PCB		10 pg/10g	5 pg/10g	5 ppt	10 ppt

Cleanup Performance of Multilayer Silica Gel Column Chromatography

GC/MS (TIC) Chromatogram



Method of Operation

10 mL sample
(Soil-heating reflux-extraction sample)

- Add 50µg anthracene*.
- Add 10µg γ-chlordane*.

Treatment of multilayer silica gel column

- Elute 100 mL hexane.

KD concentration

GC/MS (TIC)

Anthracene and γ-chlordane are added to the sample as indicators of impurity and analyte, respectively.

- Propylamide, 2. Anthracene,
- N, N*-Bis (1-methylethyl)-benzamide,
- γ-Chlordane, 5.Lenacil,
- Bis (2-ethylhexyl) Phthalate,
- Terpenes

Note : After filling in the column chromatography tube, wash it with a solvent, such as n-hexane for dioxins analysis.

B. ELISA Kits for Environmental Pollutants

What is ELISA Kit ?

ELISA...**E**nzyme-**L**inked **I**mmunosorbent **A**ssay



- ELISA is an analytical technique that uses a monoclonal antibody and an enzyme-labeled antigen.

The antibody obtained through our elaborate screening, maintains an optimum antigen binding site (epitope), allowing highly specific detection of target substance (s).

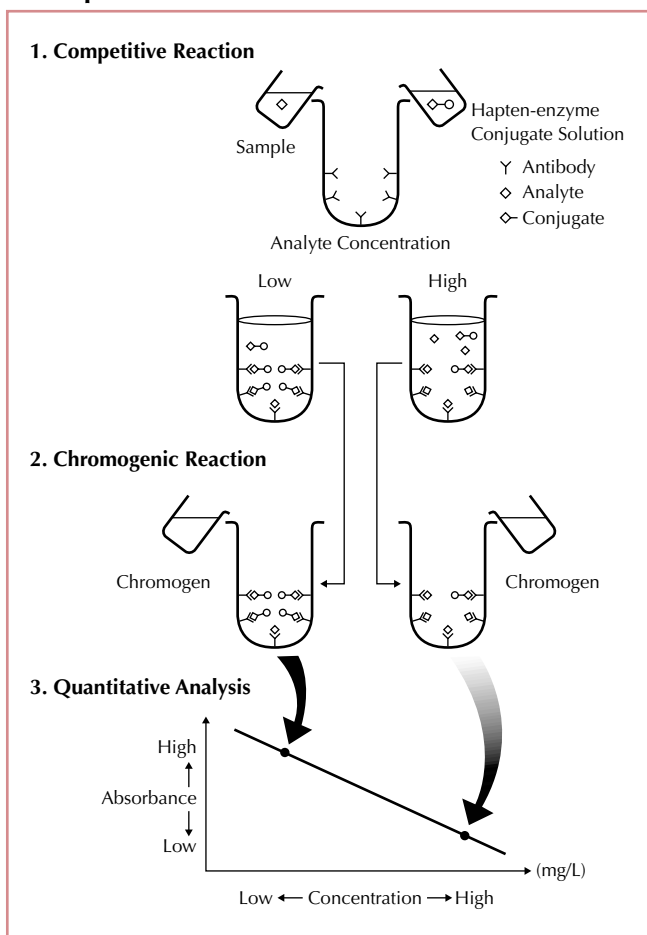
- ELISA, manufactured by Takeda Chemical Ind., Ltd. (Japan), accomplishes a wide dynamic range.

With the aid of simple pretreatment (filtration and solid phase extraction), more sensitive determination is achievable.

- The test protocol does not require harmful organic solvent, providing safer operating environment.
- The measurement is completed in 2.5 hours.

Catlog #	Description		Package Size	Storage
303-07761	ES (E1/E2/E3) ELISA KIT	Microplate	1 Kit (96 wells)	2-10°C
303-07901		Tube	1 Kit (20 tests)	
300-07771	E2 (17β-Estradiol) ELISA Kit	Microplate	1 Kit (96 wells)	
300-07911		Tube	1 Kit (20 tests)	
307-13151	Estrone (E1) ELISA Kit	Microplate	1 Kit (96 wells)	
304-08911	EE2 (Ethinylestradiol) ELISA Kit	Microplate	1 Kit (96 wells)	
300-08251	Alkyl Ethoxylate (AE) ELISA Kit	Microplate	1 Kit (96 wells)	
302-08691	AP (Alkylphenol) ELISA Kit	Microplate	1 Kit (96 wells)	
301-07701	BPA (Bisphenol A) ELISA Kit	Microplate	1 Kit (96 wells)	
308-07711		Tube	1 Kit (20 tests)	
304-06071	APE ELISA Kit	Microplate	1 Kit (96 wells)	
301-06081		Tube	1 Kit (20 tests)	
300-06051	LAS ELISA Kit	Microplate	1 Kit (96 wells)	
307-06061		Tube	1 Kit (20 tests)	

[Principle]



1. Competitive reaction

The inner surface of a well or a tube is coated with the protein called monoclonal antibody, which binds exclusively with an analyte (pollutant). The analyte derived from samples and an antigen-enzyme conjugate, which is an analyte labeled with a coloring enzyme, are premixed and subject to immobilized antibody for a competitive assay, vying for a limited number of antibody binding sites. When the analyte concentration is higher relative to the enzyme conjugate's, the analyte will predominantly bind antibody and vice versa.

2. Chromogenic Reaction

Unbound analytes and excess antigen-enzyme conjugates are washed out. Then the chromogenic substrate is added to develop color in conjunction with conjugate's enzyme. The amount of antigen-enzyme conjugate remaining with antibody will determine color intensity. The higher concentration of target substance in sample, for example, leads to less antigen-conjugate on antibody, generating lighter color, i.e. lower absorbance.

3. Quantification

The standard curve, a dose-response curve from known concentrations of analyte, is determined from the absorbance from a certain wavelength (e.g. 450nm for horseradish peroxidase and tetramethyl benzidine). The analyte concentration is accurately calculated from the response intensity of absorbance.

A. DNPH Aldehyde Analysis

Wakopak WS DNPH-II

4.6 φ × 250 mm

16 Aldehyde-DNPH Mixed Standard Sol.

018-18231, 5 × 1 mL

-20°C

Presep®-C DNPH

290-34251, 20 cartridges

2-10°C

Column Size: 4.6 φ × 250 mm

Applicable to Solid-phase extraction of carbonyl compounds in air and preparation of DNPH derivatives.

Presep®-C Ozone Scrubber

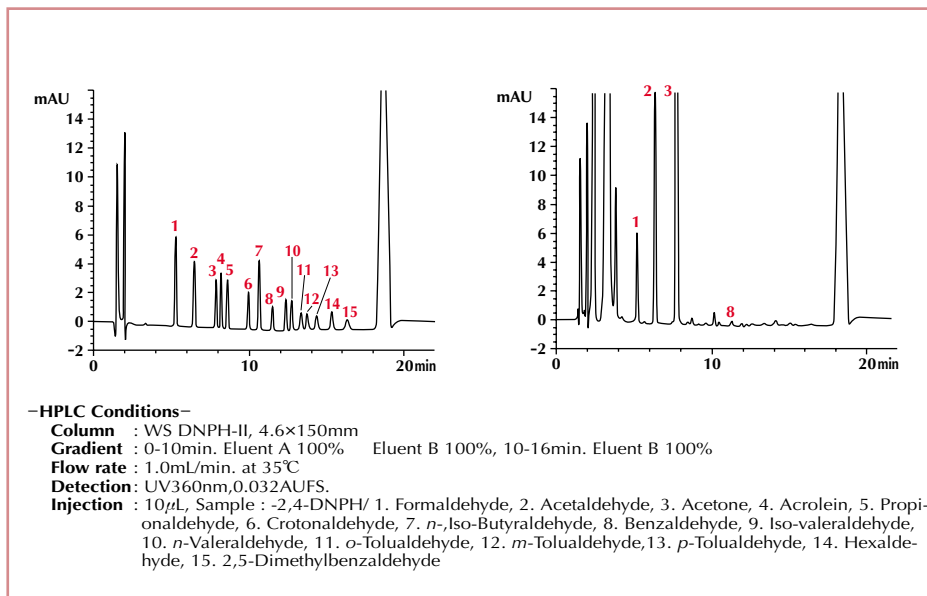
293-40351, 20 pieces

Removes ozone interference

[Related Products]

Wakosil® DNPH-II Eluent A (236-02181, 1L)

Wakosil® DNPH-II Eluent B (233-02191, 1L)



4. Water Analysis

A. Odor Detection Standards

Wako Cat. #	Description	Package, Storage	Appearance
131-12431	2-Methylisoborneol-Geosmin Mixed Standard Solution	1 mL, -20	0.1mg/mL each in methanol
134-10581	2-Methylisoborneol Standard Solution	1 mL, -20	0.1mg/mL methanol
132-07071	2-Methylisoborneol Standard, 98.0+%	20 mg, RT	White crystals
072-03421	Geosmin Standard Solution, 98.0+%	1 mL, -20	0.1mg/mL in methanol
077-01891	Geosmin Standard Solution	1 mL, 2-10	1.0mg/mL in hexane
077-01911	Geosmin Standard, 98.0+%	20 mg, 2-10	Clear liquid

•••WAKO PRODUCT UPDATE

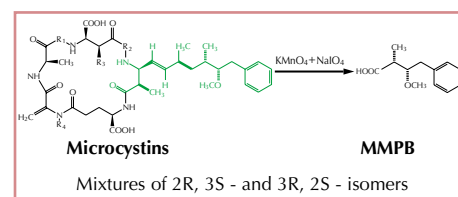
B. CSK Standards (Nitrate, Phosphate, Potassium Iodate and Silicate)

CSK Standard Solution is used for the study of the ocean environment and is recommended for use by CSK (The International Coordination Group for Cooperative Study of the Kuroshio and Adjacent Region). Wako supplies CSK standard solution Nitrate, Phosphate, Potassium Iodate and Silicate. Ask us for the detailed information.

•••WAKO PRODUCT UPDATE

C. Microcystin

Microcystin, a group of cyclic heptapeptide hepatotoxins, is the most commonly reported toxin produced by the bloom-forming cyanobacteria and a primary cause of the cyanobacterial poisoning. It was reported that Microcystin LR has a tumor promoting activity in rats as well as inhibiting ability to protein phosphatase 1 (PP1) and 2A (PP2A). Such actual and potential hazards of Microcystins emphasized the need for monitoring methods of this toxin in various water supplies.



Wako Cat. #	Description	Package, Storage	Note
133-12871	MMPB Sodium Salt Standard, 90.0+% [erythro-20Methyl-3-methoxy-4-phenylbutyric Acid Sodium Salt Std.]	1 mg, -20	Oxidation product of Microcystin
133-12251	Microcystin RR	250μg, -20	Arg-Arg(RR) analog of Microcystin-LR that is less toxic. Inhibitor of protein phosphatase 2A
136-12241	Microcystin LR	250μg, -20	A potent inhibitor of both protein PP1 and PP2A.
300-05191	Microcystin ELISA Kit (Assay range : 0.05 - 1.6 ng/mL) [manufactured by Tokiwa Chemical Industries, Ltd. (Japan)]	1 kit, 2-10	A novel monoclonal antibody against Microcystin LR shown high affinity to microcystin and good crossreactivity to various microcystin derivatives.

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D. MX-Standard

Wako Cat. No.	Description	Synonym	Note
133-11651	MX-Standard, 98.0+% [3-Chloro-4-dichloromethyl-5-hydroxy-2(5H)-furanone]	10 mg, -20	Ames Mutagenicity Test, Clear liquid

A. Solvents for Pesticide Residue • PCB Analysis

High-quality :

The undermentioned solvents guarantee the quality of concentrated solvents to 300 times or 5000 times respectively (The quality assurance has been enhanced further, and 2000 time guarantee goods have been switched to 5000 time guarantee goods one by one). There is no pollution from the cap because both 1L and 3L products have adopted the aluminum cap for the solvent which guarantees 5000 time concentrate.



Cat. No. (Pack. Size)	Description	Cat. No. (Pack. Size)	New Description	Former Cat. No. (Pack. Size)	Former Product Name
015-11281 (1L)	Acetone 300	011-19201 (1L)	Acetone 5,000	013-18301 (1L)	Acetone 2,000
011-11283 (3L)		017-19203 (3L)		019-18303 (3L)	
015-11301 (1L)	Acetonitrile 300	013-19401 (1L)	Acetonitrile 5,000	015-18361 (1L)	Acetonitrile 2,000
011-11303 (3L)					
021-08631 (1L)	Benzene 300	028-14751 (1L)	Benzene 5,000	024-14231 (1L)	Benzene 2,000
024-14351 (1L)	t-Butyl Methy Ether 300	020-14831 (1L)	t-Butyl Methy Ether 5,000	021-14361 (1L)	t-Butyl Methyl Ether 2,000
038-16751 (1L)	Cyclohexane 300	036-18631 (1L)	Cyclohexane 5,000	031-17961 (1L)	Cyclohexane 2,000
034-16753 (3L)					
039-11801 (1L)	Chloroform 300	033-18641 (1L)	Chloroform 5,000	034-17951 (1L)	Chloroform 2,000
133-08841 (1L)	Dicloromethane 300	043-28451 (1L)	Dicloromethane 5,000	047-27751 (1L)	Dicloromethane 2,000
139-08843 (3L)		049-28453 (3L)		043-27753 (3L)	
050-04461 (1L)	Diethylether 300	040-28461 (1L)	Diethylether 5,000	044-27761 (1L)	Diethylether 2,000
056-04441 (1L)	Ethanol 300	053-07011 (1L)	Ethanol 5,000	053-06771 (1L)	Ethanol (99.5) 2,000
052-04443 (3L)					
052-04421 (1L)	Ethyl Acetate 300	052-06981 (1L)	Ethyl Acetate 5,000	050-06781 (1L)	Ethyl Acetate 2,000
084-04761 (1L)	Hexane 300	083-07911 (1L)	Hexane 5,000	084-07701 (1L)	Hexane 2,000
080-04763 (3L)		089-07913 (3L)		080-07703 (3L)	
139-08821 (1L)	Methanol 300	132-14161 (1L)	Methanol 5,000	130-13621 (1L)	Methanol 2,000
135-08823 (3L)		138-14163 (3L)		136-13623 (3L)	
165-12971 (1L)	Petroleum ether 300	162-20671 (1L)	Petroleum ether 5,000	167-20001 (1L)	Petroleum Ether 2,000
203-11601 (1L)	Toluene 300	209-15581 (1L)	Toluene 5,000	201-15041 (1L)	Toluene 2,000
209-11603 (3L)		205-15583 (3L)		207-15043 (3L)	

..... WAKO PRODUCT UPDATE

B. Solvents for Environment Analysis

Wako Cat. No.	Product	Grade	Package Size	Assay
018-17815	Acetone	for Environment Analysis	500 mL	99.8+% (cGC)
015-17825	Acetonitrile		500 mL	99.8+% (cGC)
041-28055	Dichloromethane		500 mL	99.5+% (cGC)
NEW 043-28375	Dichloromethane	for Estradiol Analysis	500 mL	99.0+% (GC)
048-28065	Diethyl Ether	for Environment Analysis	500 mL	99.5+% (cGC)
055-06895	Ethyl Alcohol		500 mL	99.5+% (cGC)
NEW 084-07985	n-Heptane		500 mL	99.0+% (GC)
085-07655	Hexane		500 mL	96.0+% (cGC)
135-13855	Methanol		500 mL	99.8+% (cGC)

A. Column & Media

[a] Sample Pretreatment

Presep® Diatomaceous Earth, Granular <Syringe Type>

Ideal solid-phase extraction for combinatorial chemistry

Presep® Diatomaceous Earth column is an easy-to-use mini column product packed with granular diatomaceous earth that involves no traditionally complicated and time consuming work of extraction, requiring the use of separatory funnels and test tubes.

Diatomaceous has a wide range of application, including the use as solidification carrier and filter medium. However, it is also extremely useful in liquid and liquid extraction.

Making use of this effect, its versatility is gaining attention recently in combinatorial chemistry and in environmental analysis of agricultural chemicals.

Presep® Diatomaceous Earth column is mainly used for liquid/liquid distribution extraction of synthetic reaction liquid and moisture removal of organic solvent /water combined phase inside the column.

Our lineup of products includes 3 types, 6mL, 15 mL and 25 mL. Choose the type just right for the amount of your specimen.

**Application example**

- ① Combinatorial chemistry ② Pre-treatment for environmental analysis such as pesticide residue analysis.
③ Pre-treatment for drug analysis.

Wako Cat. #	Description	Column Volume	Packing	Holding Volume	Packing Size	Specification
292-35051	Presep® Diatomaceous Earth, Granular	6 mL	1 g	1 mL of water	100 syringes	Appearance : White, granular Particle Size : 0.5-1.4 mm : 60+% Loss on drying : < 2.0%
298-35151		15 mL	2 g	2 mL of water	100 syringes	
294-35251		25 mL	4.5 g	5 mL of water	100 syringes	

[Related Products]

Following various HPLC short columns for combinatorial chemistry are available!!!

Wakopak® Combi CN (Particle Size : 5 μ m), Wakopak® Combi ODS fast (Particle Size : 3 μ m), Wakopak® Combi ODS (Particle Size : 5 μ m).
Please see page 9 for the detailed information.

Diatomaceous Earth, Charged

046-28181, 100 g

This product is made by adding zeta-potential on the surface of diatomaceous. In addition to the original diatomaceous performance as filter aid, it is effective in removal of endotoxin, negatively-charged minute particles and microbes, owing to its electrical adsorption power of positive charge.

Diatomaceous Earth, Granular [042-28281 (100g), 048-28283 (1kg)] Particle Size : 0.5 - 1.5 mm

.....WAKO PRODUCT UPDATE

Presep®-C Alumina <Cartridge Type>

Alumina has been added newly to the cartridge type solid phase extraction column Presep® C-series. Packed with basic alumina, it can be used for cleaning up and concentration of target ingredient of various specimens in environmental analysis and food analysis.

[Feature] Excellent recovery percentage and reproducibility

Wako Cat. #	Description	Package Size
290-32051	Presep®-C Alumina	5 × 10 cartridges
[Related Products]		5 × 10 cartridges
294-31851	Presep®-C Silicagel	5 × 10 cartridges
290-31951	Presep®-C Florisil	5 × 10 cartridges
292-32251	Presep®-C C18 (ODS)	5 × 10 cartridges
296-32151	Presep®-C Na ₂ SO ₄	5 × 10 cartridges
296-32651	Presep®-C Agri (Short)	5 × 10 cartridges
290-34251	Presep®-C DNPH	20 cartridges



Presep® RPP <Syringe Type> (RPP : Reverse Phase Polymer)

Presep® RPP is a syringe type solid phase extraction column packed with styrene vinyl benzene polymethacrylate, an improved type of polymer material. Comparing with silica system fillers, it has such advantages as high retention of polar compounds and low absorption caused by the interaction with basic compounds.

It can be applied in a wide range of fields, including chemical analysis of biological specimen and environmental analysis.

[Features]

- Excellent recovery percentage and reproducibility
- Usable in a wide pH range (pH 1 to 14)



Wako Cat. #	Description	Column Volume	Packing	Packing Size	Pore Size	Pore Volume	Specific Surface Area	Particle Size
294-36851	Presep® RPP	3 mL	60 mg	5 × 10 syringes	9 nm	1.2 mL/g	600 m ² /g	30 μm
290-36951		6 mL	200 mg	5 × 10 syringes				
290-37051		6 mL	500 mg	5 × 10 syringes				60 μm

Solid phase extraction column

Presep-RPP (60mg)

Extracting condition

Solid phase extraction column conditioning

- 3 mL of CH₃OH
- 3 mL of Phosphate buffer *

Serum specimen:

1 mL of Serum** + 1 mL of Phosphate buffer are mixed and put through column. (Drug reference standard is added by 5 μg)

Wash: 1 mL of Phosphate buffer

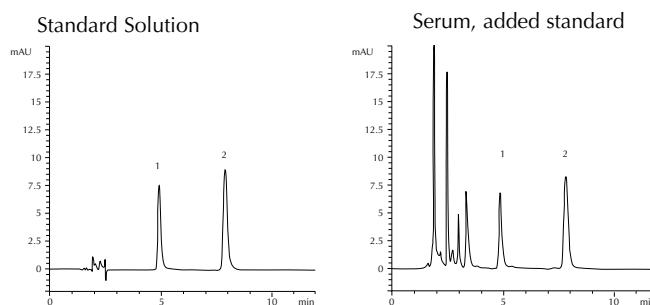
Dehydration: Air or N₂ gas for 5 minutes

Elution: 1 mL of CH₃OH

HPLC (10 μL)

*: Phosphate buffer: 20 mM phosphate buffer (pH 7)

** : Serum: Fetal bovine serum



HPLC conditions

Column WS-II 5C18 RS, 4.6 × 150mm
 Eluent CH₃CN/20mM Na₂HPO₄, NaH₂PO₄ (pH 7.6) =13/87 (v/v)
 Flow rate 1.0mL/min. at 40°C
 Detections UV 254nm
 Injection vol. 10μL
 Std. sol. 5μg/mL (CH₃OH)

Sample

- Procainamide HCl
- N-Acetyl Procainamide HCl

Fig. 1 Solid phase extraction condition

		Procainamide		N-Acetyl Procainamide	
		Ave. recovery data (%)	CV (%)	Ave. recovery data (%)	CV (%)
1	Std. Soln.	101.6	2.3	97.6	2.9
2	FBS added Std. Soln.	96.1	4.3	95.0	2.1

Table 1. Recovery Data (n=4)

Drug		Ave. recovery data (%)	CV (%)	Drug		Ave. recovery data (%)	CV (%)
1	dl-Propranolol Hydrochloride	99.3	0.5	5	p-Acetamidophenol	98.8	0.8
2	Doxepin Hydrochloride	100.3	0.7	6	Caffeine	100.2	1
3	Trimipramine Hydrochloride	96.9	1.5	7	Sulfamerazine	100.7	0.4
4	Theophirin	100.3	0.9	8	Salicylamide	100.8	0.3

Table 2. Drug Recovery Data (n=4)

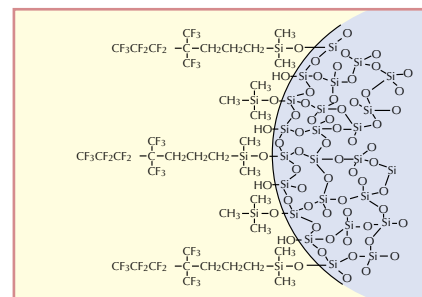
[b] HPLC

Wakopak® Fluofix

Wakopak® Fluofix is Reversed-Phase HPLC column packed with highly purified silica-gel, which were bonded with the branched fluorocarbon-chains, originally developing by NEOS Co., Ltd. Wakopak® Fluofix provides a unique separation which is different from that of ODS column. Wako succeeded to all of rights on the production, the sale, etc. on Fluofix products from NEOS on July 01, 2002.

[Features]

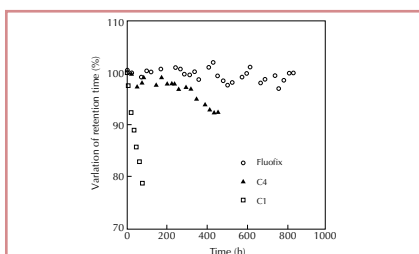
- Group Separation of the mixture Basic and Acidic compounds
- Precise separation of geometric isomers
- Separation of Fluorinated or Chlorinated compounds



Schematic Surface Model of Fluofix



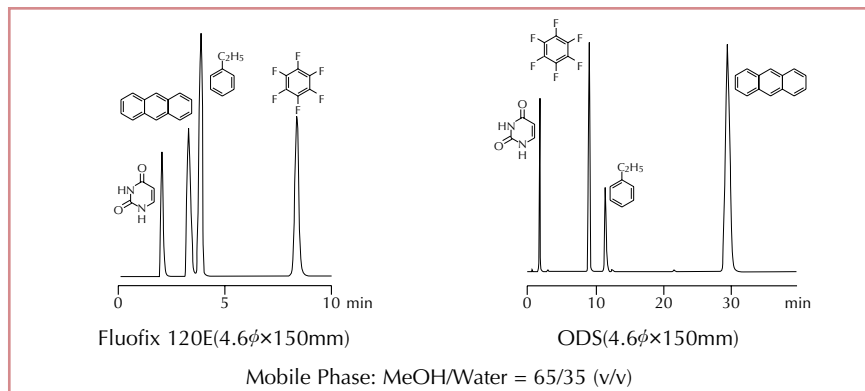
High Purity Spherical Silicagel (99.99+%)



[Condition]

Column: Wakopak® Fluofix 120N (4.6 × 150 mm)
 Mobile Phase: MeOH/0.1% TFA (pH 2.1) =60/40
 Flow Rate = 1.0 mL/min
 Temp.: 40
 Detection : UV254nm
 Sample: Hexafluorobenzene
 Fluofix has a high durability in contrast with ordinary C1, C4 hydrocarbon-bonded silica-gel columns. Fluofix gives a stable retention time over a period of 800 hour elution time and 500 injection cycles under low pH condition.

High Purity Spherical Silicagel (99.99+%)



Chromatography

Packing	Particle Size	Pore Size	Surface Area	end-capping	Purpose	Size I.D.x length (mm)
Wakopak® Fluofix 120 N	5 μm	120	300 m ² /g	No	for acidic compound	4.6φ × 150, 4.6φ × 250
Wakopak® Fluofix 120 E				Yes	for ordinary analysis	4.6φ × 150, 4.6φ × 250
Wakopak® Fluofix 300 N	5 μm	300	150 m ² /g	No	for bio-polymer	4.6φ × 150, 4.6φ × 250
Wakopak® Fluofix 300 E				Yes		4.6φ × 150, 4.6φ × 250

Please visit our homepages!

Wako Online Catalog



<http://search.wako-chem.com>

Wako USA homepage



<http://www.wakousa.com>

Wako GmbH homepage



<http://www.wakochemicals.de>

for Combinatorial Chemistry

HPLC short columns for combinatorial chemistry

Mobile Phase:

A) CH₃CN/H₂O=5/95 (v/v) 0.05% TFA

B) CH₃CN/H₂O=95/5 (v/v) 0.05% TFA

0-5min.; B conc. 0-50%

5min.- ; B conc. 50%

mDetection:

UV254nm 2.048 au/s at R.T.

Sample:

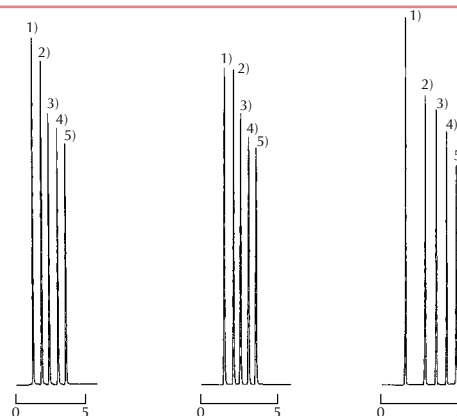
1) *p*-Hydroxybenzoic Acid

2) Methyl *p*-Hydroxybenzoate

3) Ethyl *p*-Hydroxybenzoate

4) Propyl *p*-Hydroxybenzoate

5) Butyl *p*-Hydroxybenzoate each 0.2mg/mL



Mobile Phase
Column Size
Flow Rate
Injection

Combi CN
4.6mmφ×50mm
2.0mL/min.
10μL

Combi CN
20mmφ×50mm
37.8mL/min.
190μL

Combi ODS
4.6mmφ×50mm
2.0mL/min.
10μL

Description	Particle Size	Pore Size	end-capping	Size (I.D. x Length (mm))	Column Joint Type
Wakopak® Combi CN	5μm	100	Yes	2.0 φ × 30 mm and 2.0 φ × 50 mm	Waters
				4.6 φ × 30 mm, 4.6 φ × 50 mm and 4 sets x [4.6 φ × 50 mm]	Waters & DuPont
Wakopak® Combi ODS fast	3μm			20.0 φ × 50 mm and 28.0 φ × 50 mm	Waters
				2.0 φ × 30 mm	Waters
Wakopak® Combi ODS	5μm			4.6 φ × 30 mm	Waters & DuPont
				2.0 φ × 50 mm	Waters
		4.6 φ × 50 mm and 4 sets x [4.6 φ × 50 mm]	Waters & DuPont		
				20.0 φ × 50 mm and 28.0 φ × 50 mm	Waters

WAKO PRODUCT UPDATE

B. Reagents for Ion Pair Chromatography (IPC)

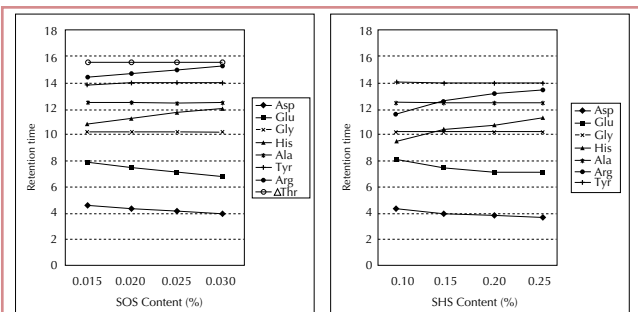


Fig.1: Relation between Retention Time of PTH-amino acid and Content of IPC reagent

Wako Cat.#	Description	Package Size
207-13701	0.5mol/L Tetra- <i>n</i> -butylammonium Phosphate Soln. (Low UV type)	100 mL
169-18231	0.5mol/L 1-Pentanesulfonic Acid Sodium Salt Soln. (Low UV type)	100 mL
086-07141	0.5mol/L 1-Hexanesulfonic Acid Sodium Salt Soln. (Low UV type)	100 mL
083-07151	0.5mol/L 1-Heptanesulfonic Acid Sodium Salt Soln. (Low UV type)	100 mL
155-01941	0.5mol/L 1-Octanesulfonic Acid Sodium Salt Soln. (Low UV type)	100 mL

HPLC Condition

Column : Wako ODS column (2.0 × 250mm)

Eluent : A) 15% CH₃CN in 50mM-Ammonium acetate buffer (pH 5.0) + Ion-pair reagent

B) 31% IPA in 50mM-Ammonium acetate buffer(pH 5.0)
0-1min; B=0%, 1-16min; B=0-100%, 16-20min;
B=100% (Liner gradient)

Flow rate : 0.3mL/min

Column temp. : 40°C

Detection : UV 269nm

Sample conc. : 25 pmol each

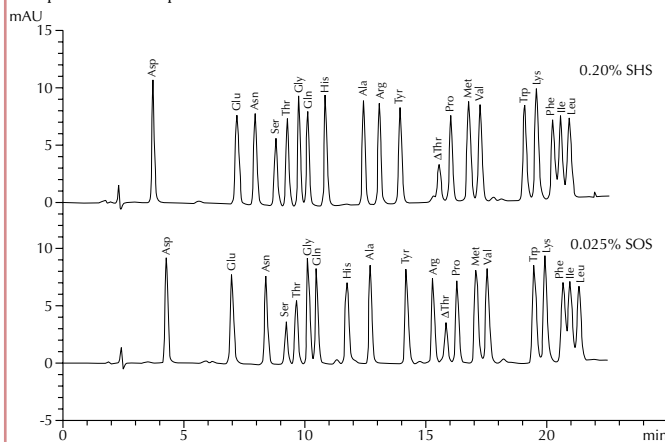


Fig. 2: PTH-amino acid separation



We have an abundant number of indicators of high multiusability, centering on indicators for titration of JIS K8001. Particularly, 100 mL bottles come in a brown-glass dropper bottle for quick and easy use.

(Dropper bottles are not available for 100 mL products marked with X.)

Indicators for titration

Wako Cat. No.	Product	Grade	Package Size	Storage	Dropper bottle
013-19141	0.1w/v% Alizarin Red S Solution	for Titration	100 mL	RT	
010-19151	6w/v% Ammonium Iron(III) Sulfate Solution		100 mL		
020-11411	0.1w/v% Bromophenol Blue Ethanol (50) Solution	for Neutrization Titration	100 mL		
022-11415			500 mL		-
026-14551	0.1w/v% Bromocresol Green Ethanol (50) Solution	for Titration	100 mL		
020-14571	Bromocresol Green-Methyl Red Ethanol Solution		100 mL		
022-14575			500 mL		-
027-14581	0.05w/v% Bromocresol Purple Ethanol (20) Solution		100 mL		
027-14601	0.1w/v% Bromothymol Blue Ethanol (50) Solution		100 mL		
029-14605			500 mL		-
025-14641	BANASS-Brilliant Yellow Methanol (90) Solution		100 mL		×
036-18511	0.1w/v% Curcumin Ethanol Solution		100 mL		
030-18531	0.1w/v% Cresol Red Ethanol (20) Solution		100 mL		
034-18551	0.1w/v% Chlorophenol Red Ethanol (20) Solution		100 mL		
045-28391	1w/v% Diphenylamine Sulfuric Acid Solution		100 mL		×
066-04241	1.5w/v% Ferroin Solution		100 mL		
099-04871	0.18w/v% Imdigo Carmine Solution	-	100 mL		×
096-04881	4.2w/v% Iron (III) Nitrate Solution	for Titration	100 mL		
139-14051	0.1w/v% Methyl Yellow Ethanol (90) Solution		100 mL		
136-10781	0.1w/v% Methyl Orange Solution	for Neutrization Titration	100 mL		
138-10785			500 mL		-
139-10771	Methyl Orange-Xylene Cyanol FF Ethanol (50) Solution	100 mL			
131-10775		500 mL	-		
130-14101	Methyl Orange-Xylene Cyanol FF-Phenolphthalein Ethanol (70) Solution	for Titration	100 mL		
137-14111	0.1w/v% Methyl Red Ethanol Solution		100 mL		
139-14115			500 mL		-
131-14131	Methyl Red-Methylene Blue Ethanol Solution		100 mL		
146-07391	0.2w/v% p-Nitrophenol Solution		100 mL		
149-07401	0.1w/v% Neutral Red Ethanol (70) Solution		100 mL		
146-07411	Neutral Red-Bromothymol Blue Ethanol Solution		100 mL		
169-20561	1w/v% Pararosolic Acid Ethanol (50) Solution		100 mL		
166-20571	0.1w/v% Pyrocatechol Violet Solution		100 mL		
160-20591	0.1w/v% Phenolphthalein Ethanol (90) Solution		100 mL		
162-20595			500 mL	-	
167-15731	1.0w/v% Phenolphthalein Ethanol (90) Solution		for Neutrization Titration	100 mL	
169-15735		500 mL	-		
160-20611	0.1w/v% Phenol Red Ethanol (20) Solution	for Titration	100 mL		
208-11771	0.1w/v% Thymolphthalein Ethanol Solution	for Neutrization Titration	100 mL		
200-11775			500 mL	-	
201-11761	0.1w/v% Thymol Blue Ethanol (50) Solution	for Titration	100 mL		
203-11765			500 mL	-	
212-01081	0.2w/v% Uranine Solution	for Titration	100 mL	2-10°C	
214-01085			500 mL	-	
248-00741	0.1w/v% Xylenol Orange Solution		100 mL	RT	

Indicators for pH Measurement

Wako Cat. No.	Product	Grade	Package Size	Storage	Dropper bottle
023-14561	0.04w/v% Bromocresol Green Solution	for pH Measurement	100 mL	RT	x
025-14565			500 mL		
024-14591	0.04w/v% Bromocresol Purple Solution		100 mL		
024-14611			100 mL		
026-14615	0.04w/v% Bromothymol Blue Solution		500 mL		x
028-14631			100 mL		
037-18541	0.04w/v% Cresol Red Solution		100 mL		
031-18561	0.04w/v% Chlorophenol Red Solution		100 mL		
038-18571	0.1w/v% Congo Red Solution		100 mL		
136-14061	0.05w/v% Methyl Yellow Ethanol Solution		100 mL		
130-14081	0.1w/v% Methyl Orange Solution		100 mL		
134-14121	0.04w/v% Methyl Red Solution		100 mL		
136-14125			500 mL		x
138-14141	0.04w/v% Metacresol Purple Solution		100 mL		
163-20601	0.04w/v% Phenolphthalein Ethanol (40) Solution		100 mL		
167-20621	0.04w/v% Phenol Red Solution		100 mL		
203-15501	0.1w/v% Thymolphthalein Ethanol Solution	100 mL			
207-15521	0.04w/v% Thymol Blue Solution	100 mL			

3. JCSS Standards

JCSS Standards (JCSS : Japan Calibration Service System) storage condition : Keep below 25°C.

Wako Cat. No.	Product	Concentration (mg/L)	Component	Package Size
016-18271	Aluminum Standard Solution	100	Al(NO ₃) ₃ in 0.5 mol/L HNO ₃	100 mL
016-15471		1,000		100 mL
013-15501	Arsenic Standard Solution	100	Dissolve As ₂ O ₃ in appropriate conc. of NaOH soln and adjust the pH to 5.0 with HCl.	100 mL
013-15481		1,000		100 mL
023-14201	Bismuth (III) Standard Solution	100	Bi(NO ₃) ₃ in 0.5 mol/L HNO ₃	100 mL
021-12661		1,000		100 mL
036-17891	Calcium Standard Solution	100	CaCO ₃ in 0.1 mol/L HNO ₃	100 mL
039-16161		1,000		100 mL
030-16211	Cadmium Standard Solution	100	Cd(NO ₃) ₂ in 0.1 mol/L HNO ₃	100 mL
036-16171		1,000		100 mL
039-17901	Cobalt Standard Solution	100	Co(NO ₃) ₂ in 0.1 mol/L HNO ₃	100 mL
033-16181		1,000		100 mL
037-16221	Chromium Standard Solution	100	K ₂ Cr ₂ O ₇ in 0.1 mol/L HNO ₃	100 mL
030-16191		1,000		100 mL
034-16231	Copper Standard Solution	100	Cu(NO ₃) ₂ in 0.1 mol/L HNO ₃	100 mL
033-16201		1,000		100 mL
091-03851	Iron Standard Solution	100	Fe(NO ₃) ₃ in 0.1 mol/L HNO ₃	100 mL
094-03841		1,000		100 mL
162-19941	Potassium Standard Solution	100	KCl in water	100 mL
165-17471		1,000		100 mL
136-13601	Magnesium Standard Solution	100	Mg(NO ₃) ₂ in 0.1 mol/L HNO ₃	100 mL
136-12121		1,000		100 mL
139-12111	Manganese Standard Solution	100	Mn(NO ₃) ₂ in 0.1 mol/L HNO ₃	100 mL
133-12131		1,000		100 mL
191-12111	Sodium Standard Solution	100	NaCl in water	100 mL
199-10831		1,000		100 mL
144-06471	Nickel Standard Solution	100	Ni(NO ₃) ₂ in 0.1 mol/L HNO ₃	100 mL
147-06461		1,000		100 mL
127-04301	Lead Standard Solution	100	Pb(NO ₃) ₂ in 0.1 mol/L HNO ₃	100 mL
124-04291		1,000		100 mL
013-18281	Antimony Standard Solution	100	SbCl ₃ in 3 mol/L HCl	100 mL
010-15491		1,000		100 mL
261-01431	Zinc Standard Solution	100	Zn(NO ₃) ₂ in 0.1 mol/L HNO ₃	100 mL
264-01421		1,000		100 mL

Wettability means a phenomenon of liquid spreading through the film surface. The index showing the degree of wetness is referred to as tensile force. For application of paint or coating on a plastic film or adhesion of a plastic film, it is necessary for plastic films to retain ink, coating agent and adhesives. Wet tensile force is used as a measure for expressing this retention capacity.

The testing method of wetting tension had been specified in JIS K6768. However in order to coordinate with the ISO International Standard, it has been drastically revised based on ISO 8296. By this revision, the types of liquid mixture for testing have increased, and the application range expanded from polyethylene and polypropylene to plastic film and sheets in general.

To the popular conventional wet index standard solutions, we have added 16 new types available in wetting tension test from 22.6 to 30.0 and from 56.0 to 73.0 according to JIS K6768 revision. All products have been renewed and we have started sales of 36 types as liquid mixtures for wetting tension test.

(Note) The color tones will differ slightly from the conventional products due to the colorants used for more stable quality. It is harmless for use.

Wetting Tension Test Mixture series

Wako Cat. No.	Description	Wetting Tension mN/m, at 23°C	Package Size
235-01791	Wetting Tension Test Mixture No. 22.6	22.6	50 mL
238-01801	Wetting Tension Test Mixture No. 25.4	25.4	50 mL
235-01811	Wetting Tension Test Mixture No. 27.3	27.3	50 mL
232-01821	Wetting Tension Test Mixture No. 30.0	30.0	50 mL
239-01831	Wetting Tension Test Mixture No. 31.0	31.0	50 mL
236-01841	Wetting Tension Test Mixture No. 32.0	32.0	50 mL
233-01851	Wetting Tension Test Mixture No. 33.0	33.0	50 mL
230-01861	Wetting Tension Test Mixture No. 34.0	34.0	50 mL
237-01871	Wetting Tension Test Mixture No. 35.0	35.0	50 mL
234-01881	Wetting Tension Test Mixture No. 36.0	36.0	50 mL
231-01891	Wetting Tension Test Mixture No. 37.0	37.0	50 mL
234-01901	Wetting Tension Test Mixture No. 38.0	38.0	50 mL
231-01911	Wetting Tension Test Mixture No. 39.0	39.0	50 mL
238-01921	Wetting Tension Test Mixture No. 40.0	40.0	50 mL
235-01931	Wetting Tension Test Mixture No. 41.0	41.0	50 mL
232-01941	Wetting Tension Test Mixture No. 42.0	42.0	50 mL
239-01951	Wetting Tension Test Mixture No. 43.0	43.0	50 mL
236-01961	Wetting Tension Test Mixture No. 44.0	44.0	50 mL
233-01971	Wetting Tension Test Mixture No. 45.0	45.0	50 mL
230-01981	Wetting Tension Test Mixture No. 46.0	46.0	50 mL
237-01991	Wetting Tension Test Mixture No. 48.0	48.0	50 mL
234-02001	Wetting Tension Test Mixture No. 50.0	50.0	50 mL
231-02011	Wetting Tension Test Mixture No. 52.0	52.0	50 mL
238-02021	Wetting Tension Test Mixture No. 54.0	54.0	50 mL
235-02031	Wetting Tension Test Mixture No. 56.0	56.0	50 mL
232-02041	Wetting Tension Test Mixture No. 58.0	58.0	50 mL
239-02051	Wetting Tension Test Mixture No. 59.0	59.0	50 mL
236-02061	Wetting Tension Test Mixture No. 60.0	60.0	50 mL
233-02071	Wetting Tension Test Mixture No. 61.0	61.0	50 mL
230-02081	Wetting Tension Test Mixture No. 62.0	62.0	50 mL
237-02091	Wetting Tension Test Mixture No. 63.0	63.0	50 mL
230-02101	Wetting Tension Test Mixture No. 64.0	64.0	50 mL
237-02111	Wetting Tension Test Mixture No. 65.0	65.0	50 mL
234-02121	Wetting Tension Test Mixture No. 67.0	67.0	50 mL
231-02131	Wetting Tension Test Mixture No. 70.0	70.0	50 mL
238-02141	Wetting Tension Test Mixture No. 73.0	73.0	50 mL



Bio Chemistry

Expression and tissue localization of MMP* have been realized !!!

MMP *in situ* Zymo-Film (Cat. #295-58001, 50 tests) is applicable to tissue localization of various proteinase including MMPs.

MMP-PT *in situ* Zymo-Film** (Cat. #295-58001, 50 tests) is applicable to tissue localization of various proteinase except MMPs.

*MMP : matrix metalloproteinase **PT : 1,10-phenanthroline as a MMP inhibitor

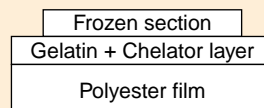
Kit Contents (50 tests)

- ① Zymo-Film 50 pieces
- ② Holder 2 pieces
- ③ Coverfilm 52 pieces

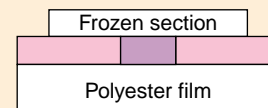


A frozen section of Mouse small intestine treated on a MMP *in situ* Zymo-Film, followed by Biebrich Scarlet staining and Mayer's Hematoxyline staining

[Principle]



A frozen section is placed on the film, and incubated at 37°C for 6 ~ 30 hrs.



During incubation, gelatin on the film is digested by protease localizing in the tissue.

These products were made under the license of Fuji Photo Film Co., Ltd. (Japan)

[Features]**Ultra high purity**

Ultra high purity reagent with every metallic impurity controlled to the ppt level.

Fluorocarbon resin (PFA) container used

(High density polyethylene container is used for ultra pure water.)

In order to retain the quality of ppt level, PFA container is fully cleaned before packing.

Double plastic bag packing

Processes up to single plastic bag (inside) packing are done inside the clean room so it can be brought into the clean room freely.

Certificate of Analysis attached

Metallic impurity analysis is conducted based on ICP/MS, FL/AAS and the analysis report is attached to the product.

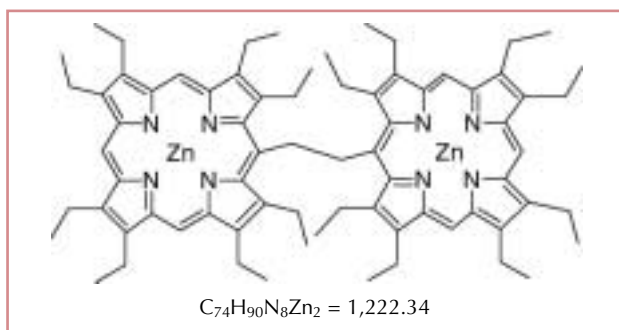
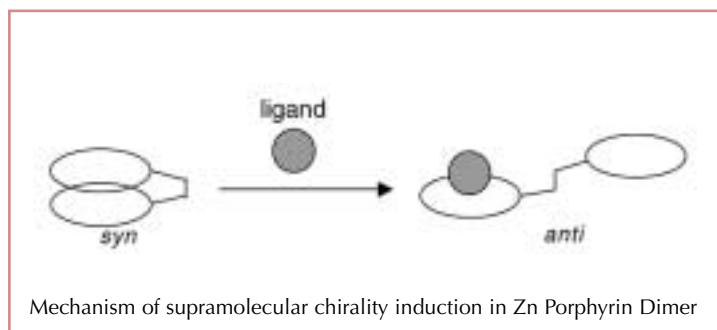
**NEW**

Description	Hydrofluoric Acid	Hydrochloric Acid	Nitric Acid (1.42)	Sulfuric Acid	Ultrapure Water
Wako Cat. #	081-07755	089-07555	148-06935	198-11825	217-01031
Grade	for Ultratrace Analysis				
Package Size	500 mL	500 mL	500 mL	500 mL	1 L
	HF = 20.01	HCl = 36.46	HNO ₃ = 63.01	H ₂ SO ₄ = 98.08	H ₂ O = 18.02
CAS No.	7664-39-3	7647-01-0	7697-37-2	7664-93-0	7732-18-5
Storage Condition	2-10	RT	RT	RT	RT
<Specification>					
Assay	50%	36%	69%	97%	-
Aluminium (Al) ppt	<10	<10	<10	20	<10
Antimony (Sb) ppt	<10	-	-	-	-
Arsenic (As) ppt	-	<10	<10	<10	<10
Barium (Ba) ppt	<10	<10	<10	<10	<10
Beryllium (Be) ppt	<10	<10	<10	<10	<10
Bismuth (Bi) ppt	<10	<10	<10	<10	<10
Cadmium (Cd) ppt	<10	<10	<10	<10	<10
Calcium (Ca) ppt	<20	20	10	50	<10
Chromium (Cr) ppt	<10	10	35	<20	<10
Cobalt (Co) ppt	<10	<10	<10	<20	<10
Copper (Cu) ppt	<10	<10	<10	<20	<10
Gold (Au) ppt	<10	-	-	-	-
Iron (Fe) ppt	<10	80	55	40	<10
Lead (Pb) ppt	<10	<10	<10	<20	<10
Lithium (Li) ppt	<10	<10	<10	<10	<10
Magnesium (Mg) ppt	<10	10	<10	<20	<10
Manganese (Mn) ppt	<10	<10	<10	<20	<10
Molybdenum (Mo) ppt	<10	<10	<10	-	<10
Nickel (Ni) ppt	<10	10	<10	<20	<10
Potassium (K) ppt	<20	<10	<10	<20	<10
Rhodium (Rh) ppt	-	<10	<10	-	<10
Rubidium (Rb) ppt	-	<10	<10	-	<10
Silver (Ag) ppt	<10	<10	<10	<10	<10
Sodium (Na) ppt	<10	<10	25	20	<10
Strontium (Sr) ppt	<10	<10	<10	<10	<10
Thorium (Th) ppt	<10	<10	<10	-	<10
Tin (Sn) ppt	<10	<10	<10	<10	<10
Tungsten (W) ppt	-	<10	<10	-	<10
Uranium (U) ppt	<10	<10	<10	-	<10
Zinc (Zn) ppt	<10	<10	<10	<50	<10

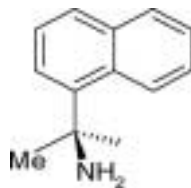
A Supramolecular Chirality Sensor- an Absolute Configuration Probe for Circular Dichroism Analysis

Zinc Porphyrin Dimer

267-01651, 20 mg



The achiral *syn* folded (face-to-face conformation) host molecule of the ethane-bridged Zinc Porphyrin Dimer in which two porphyrin rings are linked by a short ethane bridge transforms into the corresponding chiral extended *anti* bis-ligated species in the presence of enantiopure amine guests. The mechanism of the supramolecular chirogenesis is based upon the screw formation in Zinc Porphyrin Dimer, arising from steric interactions between the largest substituent at the ligand's asymmetric carbon and peripheral alkyl groups of the neighboring porphyrin ring pointing toward the covalent bridge. The screw direction is determined by the guest's (amines) absolute configuration resulting in a positive chirality induced by (*S*)-enantiomers due to formation of the right-handed screw, and a negative chirality produced by the left-handed screw of (*R*)-enantiomers. The screw magnitude is strongly dependent upon the structure of the chiral guests. The amines with bulkier substituents result in stronger CD signals and larger ¹H NMR resonance splittings of enantiotopic protons. This system possesses a high degree of chiroptical activity. It allows the differentiation of one of the smallest homologous elements of organic chemistry, that is, the methyl and ethyl groups attached to the asymmetric carbon, and additionally, which senses a remote chiral center at a position β to the amine binding group. This reagent was developed by Prof. Yoshihisa Inoue, Inoue Photochirogenesis Project, ERATO, JST (Osaka, Japan).

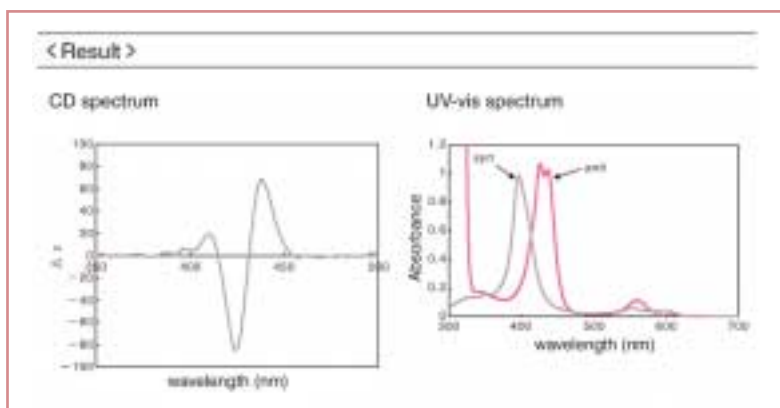
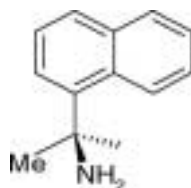
[Experiment 1]Sample : (*S*)-1-(1-Naphthyl)ethylamine

CD scanning conditions (RT) :

Volume of Zn Porphyrin Dimer : 3 mL (3.66×10^{-6} mol/L)Sample volume : 20 μ L (21.3 mg)

Instrument : JASCO J-720WI spectropolarimeter

Accumulations = 1 time

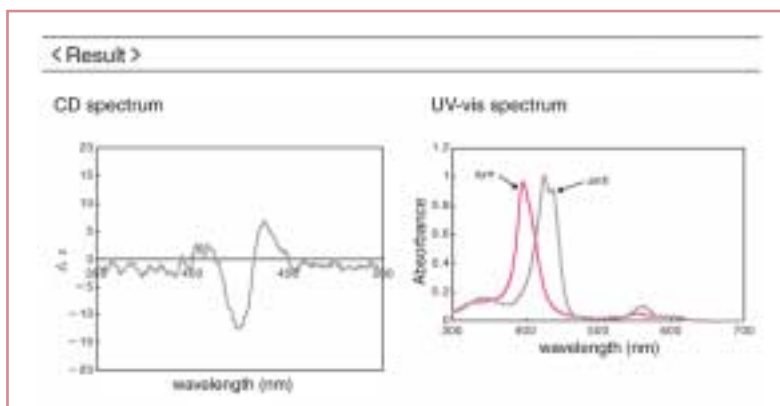
**[Experiment 2]**Sample : (*S*)-*sec*-Buthylamine

CD scanning conditions (RT) :

Volume of Zn Porphyrin Dimer : 3 mL (3.66×10^{-6} mol/L)Sample volume : 3 μ L (2.17 mg)

Instrument : JASCO J-720WI spectropolarimeter

Accumulations = 10 times



A. Solvents for Spectrochemical Analysis

Useful for various spectrochemical analysis such as absorptiometry.

[Specification]

Description	Dimethyl Sulfoxide	2,2,4-Trimethylpentane
Wako Catalog No.	045-28335	204-15455
Appearance	Colorless, clear liquid	Colorless, clear liquid
Density (20°C)	1.099-1.103 g/mL	0.690-0.693 g/mL
Refractive index n _{20D}	1.477-1.480	1.390-1.393
Absorbance	265 nm	< 0.80
	270 nm	< 0.45
	280 nm	< 0.25
	310 nm	< 0.07
	350-400 nm	< 0.01
Water	< 0.1 %	< 0.01 %
Fluorescence test	to pass test	to pass test
Assay (cGC)	99.9+ %	99.8+ %



Wako Cat. No.	Description	Package Size
014-19095	Acetone	500 mL
017-19105	Acetonitrile	500 mL
027-14525	Benzene	500 mL
021-14545	1-Butanol	500 mL
024-14535	t-Butyl Methyl Ether	500 mL
038-18495	Chloroform	500 mL
031-18505	Cyclohexane	500 mL
041-28295	1,2-Dichloroethane	500 mL
044-28305	Dichloromethane	500 mL
041-28315	Diethyl Ether	500 mL
048-28325	N,N-Dimethylformamide	500 mL
045-28335	Dimethyl Sulfoxide	500 mL

Wako Cat. No.	Description	Package Size
042-28345	1,4-Dioxane	500 mL
049-28355	Distilled Water	500 mL
052-06925	Ethanol (99.5)	500 mL
059-06935	Ethyl Acetate	500 mL
080-07845	Heptane	500 mL
087-07855	Hexane	500 mL
139-13995	Methanol	500 mL
169-20485	2-Propanol	500 mL
200-15435	Tetrahydrofuran	500 mL
207-15445	Toluene	500 mL
204-15455	2,2,4-Trimethylpentane	500 mL

Analytical Standards

1. Vitamin Analysis

 α - and β -Carotene Standards

With the internationalization trend of food environment, review is taking place in the labeling of food nutrition and in the analysis method. Quick and high precision analysis methods are focusing a spotlight of attention for analysis of vitamins. As a part of this high performance liquid chromatography has been introduced as an official method. Provitamin A contained abundantly in food is mainly β -carotene. Traditionally, food analysis has been made mostly by β -carotene quantitative analysis. However, for foods such as tomato processed food that contain lycopene and β -carotene, it is recommended to measure β -carotene and β -carotene separately and take the sum as the total carotene value. Carotene easily decomposes in the air and changes by light. Thus high purity carotene standard product is necessary.

Wako Cat. No.	Product	Synonym	Grade	Assay (HPLC)	Package Size	Storage Condition
035-17981	α -Carotene Standard	Provitamin A	for HPLC	95.0+ %	10 mg	-20
032-17991	β -Carotene Standard	Provitamin A		95.0+ %	10 mg	-20

[Related Products]

Wako Cat. No.	Product	Synonym	Grade	Assay (HPLC)	Package Size	Storage Condition
188-01331	Retinol Palmitate Standard Solution (190,000-240,000 IU/g)	Vitamin A Palmitate	for HPLC	-	20 capsules	2-10
125-04341 121-04343	Lycopene	-	for Biochemistry	-	25 mg 100 mg	-80
182-01611	Riboflavin Standard	Vitamin B2	for HPLC	98.0+ %	200 mg	2-10
168-20031	Pyridoxine Hydrochloride Standard	Vitamin B6	for Vitamin Analysis	98.0+ %	200 mg	2-10
165-20041	Pyridoxal Hydrochloride Standard	Vitamin B6		98.0+ %	200 mg	-20
162-20051	Pyridoxamine Dihydrochloride Standard	Vitamin B6		98.0+ %	200 mg	2-10

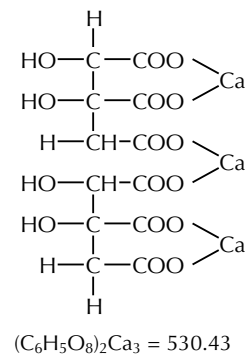
Wako Cat. No.	Product	Synonym		Grade	Assay (HPLC)	Package Size	Storage Condition
011-16641	L(+)-Ascorbic Acid Standard	Vitamin C	C ₆ H ₈ O ₆ = 176.13 CAS 50-81-7	for HPLC	99.0+ %	200 mg	2-10
302-07111 manufactured by ESAI	Vitamine E Reference Standard Contents (1 vial ea. × 250 mg) : d- -Tocopherol; d- -Tocopherol; d- -Tocopherol; d- - Tocopherol ; 2,2,5,7,8-Pentamethyl-6-hydroxychroman				-	1 set	
167-19011	Phylloquinone Standard	Vitamin K1	C ₃₁ H ₄₆ O ₂ = 450.70 CAS 84-80-0	for HPLC	99.0+ %	200 mg	
136-12861	Menaquinone-4 Standard	Vitamin K2	C ₃₁ H ₄₀ O ₂ = 444.65 CAS 863-61-6		99.5+ %	200 mg	
210-01021	Ubiquinone-10 Standard	Coenzyme Q10	CAS 303-98-0		99.5+ %	200 mg	
032-11651	Cocarcboxylase Standard		CAS 154-87-0	for Vitamin Assay	99.5+ %	100 mg	-20
080-00405	Hexane		CAS 110-54-3		96.0+ %	500 mL	RT
209-10841	Thiamine Triphosphate		-		98.0+ %	10 mg	-20
048-18991	Dibenzoyl Thiamin		CAS 299-88-7	for Vitamin B1 Assay	98.0+ %	5 g	RT
227-00611	Vitachange, Activated		-		-	250 g	
223-00635	Vitachange		-		-	500 g	
046-18992	Dibenzoyl Thiamin		CAS 299-88-7		98.0+ %	25 g	
016-08163	Acetyl Chloride		CAS 75-36-5	for Vitamin D Assay	98.0+ %	25 mL	< 25
058-04901	Ergosterol Benzoate		CAS 5035-30-3	for Vitamin E Assay	98.0+ %	1 g	2-10
162-11261	2,2,5,7,8-Pentamethyl-6-chromanol		CAS 950-99-2		98.0+ %	1 g	2-10
059-04811	Ergosterol Acetate		-		97.0+ %	1 g	-20
202-08403	(±)- -Tocopherol Acetate		CAS 7695-91-2	Wako Special Grade	98.0+ %	5 g	2-10
204-08402						25 g	
206-08401						100 g	

2. Food Analysis

A. Food Analysis

For nutritional supplementary food, system development is on the way for defining the labeling standard of nutritional ingredient specification and nutritious function based on pharmaceutical preparations.

(-) - hydroxy citric acid (also referred to as HCA) is an effective ingredient of garcinia extract used widely in diet food for obesity prevention. The Japan Health Food and Nutritious Food Association defined the standard of garcinia extract food using the effective ingredient (-) - hydroxy citric acid calcium as the index.



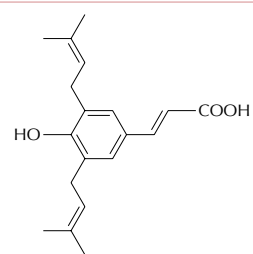
Wako Cat. No.	Description	Synonym		Grade	Assay (HPLC)	Package Size	Storage Condition
084-07821	(-)-Hydroxycitric Acid Calcium Salt Standard	HCA Calcium Salt	(C ₆ H ₅ O ₈) ₂ Ca ₃ = 530.43 White, powder	for HPLC	98.0+ %	200 mg	2-10

.....WAKO PRODUCT UPDATE

Artepillin C is a biologically active substance contained in health food propolis and is reported to have antioxidative effect and anticancer activity.

References:

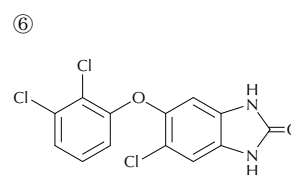
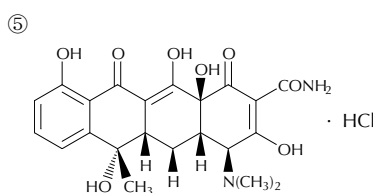
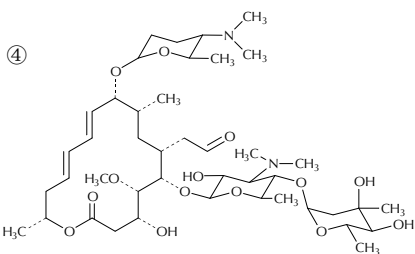
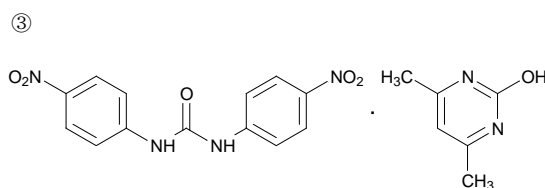
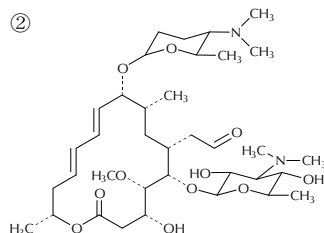
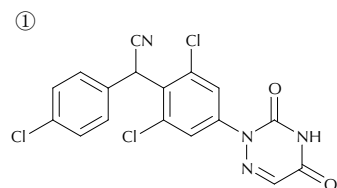
- Hayashi, K., Komura, S., Isaji, N., Ohixhi, N. and Yagi, K.: *Chem. Pharm. Bull.*, **47**, 1521 (1999).
- Aga, H., Shibuya, T., Sugimoto, T., Kurimoto, M. and Nakajima, S.: *Biosci. Biotech. Biochem.*, **58**, 945 (1994).



Wako Cat. No.	Description		Grade	Assay (HPLC)	Package Size	Storage Condition
016-19131	Artepillin C, from Propolis	C ₁₉ H ₂₄ O ₃ = 300.39	for Biochemistry	98.0+ %	10 mg	2-10

B. Analysis of Animal Drugs

Wako Cat. No.	Product	Package, Storage	Appearance	Chemical Structure
048-28021	Diclazuril Std., 99.0+%	10 mg, 2-10	Slightly pale yellow, crystalline powder	①
147-07061	Neospiramycin I Std., 97.0+%	10 mg, 2-10	White, powder	②
146-07151	Nicarbazin Std., 98.0+%	200 mg, 2-10	Yellow, powder	③
197-11971	Spiramycin I Std., 97.0+%	10 mg, 2-10	White, powder	④
206-15091	Tetracycline Hydrochloride Std. 99.0+%	200 mg, 2-10	Yellow, crystalline powder - powder	⑤
200-14891	Triclabendazole Oxon Std., 98.0+%	100 mg, 2-10	Slightly pale graysh white, crystalline powder	⑥



Organic Chemistry

Green Chemistry Reagents

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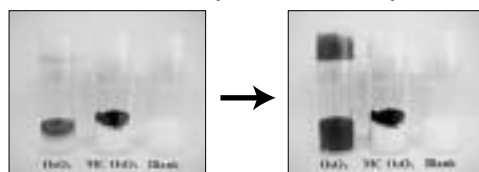
Readily recoverable and reusable by filtration Higher Activity and Easier Separation

Microencapsulated Catalysts

Osmium (VIII) Oxide, Microencapsulated

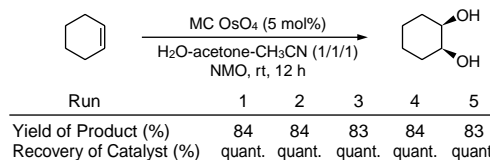
Cat. #153-02081, 1g

Low Volatility and Low Toxicity



Before

After 3 Days

Recovery and reuse of MC OsO₄

Scandium Trifluoromethanesulfonate, Microencapsulated

Cat. #196-12041, 1g

Imino Aldol Reaction (Flow System)



Other reactions

- Aldol reaction (Batch System)
- Allylation reaction of aldehyde
- Allylation reaction of Imine (Flow System)
- Aza Diels-Alder reaction (Flow System)
- Cyanation reaction of aldehyde (Batch System)
- Diels-Alder reaction (Batch System)
- Friedel-Crafts Acylation (Batch System)
- Mannich-type reaction
- Michael reaction
- Quinoline Synthesis (Flow System)
- Strecker reaction (Flow System)

Wako Cat. #	Description	Package	CAS #	Storage	Wako Cat. #	Description	Package	CAS #	Storage
019-14621	Aconitine std.	20 mg	302-27-2	2-10	072-03301	Ginsenoside-Rd std.	20 mg	52705-93-8	2-10
012-14091	Albiflorin std.	20 mg	39011-90-0		075-03271	Ginsenoside-Re std.	20 mg	52286-59-6	
018-13231	Alisol B Acetate, 98.0+%	20 mg	-		072-02201	Ginsenoside-Rg1 std.	10 mg	22427-39-0	
010-13431	Alisol B std.	20 mg	-		071-02271	Glycyrrhizin std.	20 mg	1405-86-3	
015-11921	Arbutin std.	20 mg	-		089-04951	Honokiol std.	20 mg	35354-74-6	
012-14611	Atractylenolide III std.	20 mg	73730-71-4		081-06851	(E)-10-Hydroxy-2-decenoic Acid std.	20 mg	14113-05-4	< 25
016-11691	Atropine Sulfate std.	20 mg	5908-99-6		084-07061	Hypaconitine	20 mg	6900-87-4	
016-10351	Aucubin std.	20 mg	479-98-1		099-03651	Isofraxidine std.	20 mg	486-21-5	2-10
027-07751	Baicalein std.	20 mg	491-67-8		125-03361	Liquiritin std.	20 mg	-	
020-07741	Baicalin std.	20 mg	21967-41-9		125-03621	Loganin std.	20 mg	18524-94-2	
022-08161	Barbaloin std.	10 mg	1415-73-2		137-09081	Magnolol std.	20 mg	528-43-8	< 25
022-07681	Berberine Chloride std.	20 mg	633-65-8		130-12261	Mesaconitine	20 mg	2752-64-9	
028-12051	Bergenin std.	20 mg	477-90-7		140-06211	Naringin std.	20 mg	10236-47-2	2-10
025-10121	Bufalin std.	20 mg	465-21-4		151-01801	Osthole std.	20 mg	484-12-8	
024-10691	Bufotalin std.	20 mg	471-95-4		150-01511	Oxymatrine std.	20 mg	16837-52-8	
030-10611	Capillarisin std.	10 mg	56365-38-9		167-11711	Paeoniflorin std.	10 mg	23180-57-6	
036-10613		50 mg			163-11713		50 mg		
031-15141	Capsaicin std.	20 mg	404-86-4		169-12871	Paeonol std.	10 mg	552-41-0	
032-10551	Catalpol std.	20 mg	2415-24-9		166-17641	Palmatine Chloride std.	20 mg	10605-02-4	
038-13711	Cinobufagin std.	20 mg	470-37-1		164-14901	(+)-Phyllodulcin std.	20 mg	21499-23-0	
035-13721	Cinobufotalin std.	20 mg	1108-68-5	162-14701	Puerarin std.	20 mg	3681-99-0		
036-11311	Coptisine Chloride	20 mg	6020-18-4	184-00951	Resibufogenin std.	20 mg	465-39-4		
036-14971	Corydaline std.	20 mg	518-69-4	RT	183-00921	Rutaecarpine std.	20 mg	-	RT
032-13731	Costunolide std.	20 mg	553-21-9	-20	190-08411	Saikosaponin a std.	10 mg	20736-09-8	
043-27611	Dehydrocorydaline Nitrate std.	10 mg	-	2-10	194-10021	Saikosaponin b2 std.	20 mg	58316-41-9	2-10
040-21881	Dehydrocostuslactone std.	20 mg	477-43-0		197-08421	Saikosaponin c std.	10 mg	20736-08-7	
044-25321	Dihydrocapsaicin std.	20 mg	19408-84-5		194-08431	Saikosaponin d std.	10 mg	20874-52-6	
042-18911	Dimethylesculetin std.	20 mg	-		192-10441	Schizandrin std.	20 mg	7432-28-2	
052-04921	Ergosterol std.	20 mg	57-87-4	-20	197-09261	Scopolamine Hydrobromide, 99.0+%	20 mg	114-49-8	2-10
056-05161	β -Eudesmol std.	20 mg	473-15-4	190-08531	Sennoside A std.	10 mg	81-27-6		
050-04601	Evodiamine std.	20 mg	518-17-2	194-09271	Sennoside B, 96.0+%	20 mg	128-57-4		
070-02241	Geniposide std.	20 mg	24512-63-8	199-11811	Sennoside B std.	10 mg	128-57-4		
078-02301	Geniposidic Acid std.	20 mg	27741-01-1	191-08681	Shikonin std.	10 mg	517-89-5		
077-02871	6-Gingerol std.	20 mg	23513-14-6	193-09361	Sinomenine std.	20 mg	115-53-7		
079-02191	Ginsenoside-Rb1 std.	10 mg	41753-43-9	197-08541	Swertiamarin std.	20 mg	-		
078-03261	Ginsenoside-Rc	20 mg	11021-14-0	231-00811	Wogonin std.	10 mg	632-85-9		

A. Environmental Analysis Standards

Wako Cat. No.	Product	Package	CAS No.	Note	Appearance	Storage
039-17881	Copper Pyrethione Std., 98.0+% (HPLC)	500 mg	17652-46-9	Standard for LC/MS and LC analysis	Powder	2-10
044-28361	Di-n-octyl Phthalate Std., 98.0+% (cGC)	200 mg	117-84-0	a phthalate standard	Clear liquid	
209-15461	Tributyltin (IV) Chloride Std., 99.0+% (cGC)	500 mg	1461-22-9	a marine pollutant from ships and fishnet	Clear liquid	RT
208-15551	2,2',3-Trihydroxybiphenyl Std., 98.0+% (HPLC)	100 mg	91368-55-7	a dibenzofuran decomposition product	Powder	
201-15541	2,2',3-Trihydroxydiphenyl Ether Std., 97.0+% (HPLC)	100 mg	128292-53-5	a dioxin decomposition product	Powder	2-10
264-01541	Zinc Pyrethione Std., 99.0+% (HPLC)	500 mg	13463-41-7	Standard for LC/MS and LC analysis	Powder	

WAKO PRODUCT UPDATE

B. Pesticides Mixed Standard Solutions

Wako Cat. No.	Product	Package, Storage	Ingredients	Note
167-18411	4 Pesticides Mixed Standard Solution	5Ax1 mL -20	① Diazinon Oxon, ② EPN Oxon, ③ Isoxathion Oxon, ④ MEP Oxon. 100 μ g each is dissolved in 1 mL acetone	organophosphorus analysis
164-19901	7 Pesticides Mixed Standard Solution	5Ax1 mL -20	① Asulam, ② Bentazone, ③ Carbofuran, ④ MCP, ⑤ 2,4-PA, ⑥ Thiuram, ⑦ Triclopyr. 100 μ g each is dissolved in 1 mL Acetonitrile	used at golf course; for HPLC
160-18401	8 Pesticides Mixed Standard Solution	5Ax1 mL -20	① Asulam, ② Bensulide, ③ Iprodione, ④ MCP, ⑤ Pencycuron, ⑥ Thiuram, ⑦ TPN, ⑧ Siduron. 100 μ g each is dissolved in 1 mL acetonitrile	used at golf course; for HPLC
164-18421	13 Pesticides Mixed Standard Solution	5Ax1 mL -20	① Benthocarb, ② BPMC, ③ CAT, ④ CNP, ⑤ DDVP, ⑥ Diazinon, ⑦ EPN, ⑧ IBP, ⑨ Isoprothiolane, ⑩ Isoxathion, ⑪ MEP, ⑫ Propyzamide, ⑬ TPN. 10 μ g each is dissolved in 1 mL acetone	for GC/MS
162-19201	32 Pesticides Mixed Standard Solution	5Ax1 mL -20	① Acephate, ② Methamidophos, ③ Bensulide, ④ Bethrodine, ⑤ Butamifos, ⑥ Captan, ⑦ CAT, ⑧ Chloroneb, ⑨ Chlorpyrifos, ⑩ DEP, ⑪ Diazinon, ⑫ Dithiopyr, ⑬ Echlomezol, ⑭ Flutolanil, ⑮ Iprodione, ⑯ Isofenphos, ⑰ Isoprothiolane, ⑱ Isoxathion, ⑲ MBPMC, ⑳ MEP, ㉑ Mepronil, ㉒ Metalaxyl, ㉓ Methylidymron, ㉔ Napropamide, ㉕ Pencycuron, ㉖ Pendimethalin, ㉗ Propyzamide, ㉘ Pyributicarb, ㉙ Pyridaphenthion, ㉚ Tolclofos-methyl, ㉛ TPN, ㉜ Triclopyr-2-butoxyethyl. 10 μ g each is dissolved in 1 mL of acetone	used for golf course; for GC/MS

Organic Chemistry

Green Chemistry Reagents

Research Use Only

Readily recoverable and reusable by filtration Higher Activity and Easier Separation

Amphiphilic Resin-Supported Pd-Phosphin Catalyst

Di- μ -chlorobis[(η -allyl) palladium (II)], Supported PEG-PS Resin

Cat. #043-27731, 500mg

Applications

- High catalytic activity of PEP-Pd in the allylic substitution in water
- Hydroxycarbonylation of aryl halides in water catalyzed by PEP-Pd.
- Cross-coupling of aryl halides and allyl acetates with arylboron reagents in water catalyzed by PEP-Pd.

Standard

C. Standards for Residual Pesticide Analysis

Wako Cat. No.	Product	Package, Storage	Physical Data	Appearance	Note	Chemical Structure
018-18591	Acequinocyl Std., 98.5+% (HPLC)	200 mg 2-10	C ₂₄ H ₃₂ O ₄ = 384.51 CAS: 57960-19-7 Chemical Name: 3-Dodecyl-1,4-dihydro-1,4-dioxo-2-naphthyl Acetate	Pale yellow, powder	Insecticide m.p.: 59.6	
011-18601	Acequinocyl-hydroxy Std., 99.0+% (HPLC)	200 mg 2-10	C ₂₂ H ₃₀ O ₃ = 342.47 CAS: 57960-31-3 Chemical Name: 2-Hydroxy-3-dodecyl-1,4-naphthoquinone	Yellow, crystalline powder	Acequinocyl metabolite	
014-18331	Acibenzolar-S-methyl Std., 99.5+% (HPLC)	200 mg 2-10	C ₈ H ₆ N ₂ OS ₂ = 201.28 CAS: 135158-54-2 Chemical Name: S-Methyl Benzo[1,2,3]thiadiazole-7-carbothioate	Crystalline powder	Fungicide m.p.: 132.9	
012-18251	Azimsulfuron Std., 99.0+% (GC)	200 mg 2-10	C ₁₃ H ₁₆ N ₁₀ O ₅ S = 424.40 CAS: 120162-55-2 Chemical Name: 1-(4,6-Dimethoxyimidin-2-yl)-3-[1-methyl-4-(2-methyl-2H-tetrazol-5-yl)pyrazol-5-ylsulfonyl] urea	White, powder	Herbicide m.p.: 170-173	
019-19001	Azoxystrobin Std. 99.0+% (HPLC)	200 mg 2-10	C ₂₂ H ₁₇ N ₃ O ₅ = 403.39 CAS: 131860-33-8 Chemical Name: Methyl (E)-2-[2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl]-3-methoxyacrylate	White, powder	Fungicide m.p.: 115.8	
026-14671	Bifenazate Std., 99.0+% (HPLC)	200 mg 2-10	C ₁₇ H ₂₀ N ₂ O ₃ = 300.35 CAS: 149877-41-8 Chemical Name: Isopropyl 2-(4-Methoxybiphenyl-3-yl)hydrazinoformate	White, crystalline powder	Acaricide m.p.: 142.5	
033-18141	Chromafenozide Std., 99.0% (HPLC)	200 mg 2-10	C ₂₄ H ₃₀ N ₂ O ₃ = 394.51 CAS: 143807-66-3 Chemical Name: N'-tert-Butyl-N''-(3,5-dimethylbenzoyl)-N-5-methyl-6-chromancarbohydrazine	White, powder - crystalline powder	Insecticide m.p.: 188.5-190.9	
047-28111	Desmedipham Std., 99.0+% (HPLC)	200 mg 2-10	C ₁₆ H ₁₆ N ₂ O ₄ = 300.31 CAS: 13684-56-5 Chemical Name: Ethyl 3-Phenylcarbamoyloxycarbanilate	White, powder	Herbicide m.p.: 120	
040-28101	Diclocymet Std., 99.0+% (GC)	200 mg 2-10	C ₁₅ H ₁₈ N ₂ O= 313.22 CAS: 139920-32-4 Chemical Name: (R,S)-2-Cyano-N-[(R)-1-(2,4-dichlorophenyl)ethyl]-3,3-dimethylbutylamide	White, powder	Fungicide m.p.: 152-156	
044-28121	Diflufenican Std., 99.0+% (GC)	200 mg 2-10	C ₁₉ H ₁₁ N ₂ O ₂ = 394.29 CAS: 83164-33-4 Chemical Name: 2',4'-Difluoro-2-(alpha,alpha-trifluoro-m-tolyloxy)nicotinamide	White, crystalline powder	Herbicide m.p.: 161-162	
046-28441	4,4-Dimethyl-2-oxazolidinone Std., 99.0+% (cGC)	200 mg 2-10	CAS: 26654-39-7 M.W. 115.13	White, powder - crystalline powder	Oxpoconazole Fumarate metabolite m.p.: 52.1-55.6	

C. Standards for Residual Pesticide Analysis –Continued–

Wako Cat. No.	Product	Package, Storage	Physical Data	Appearance	Note	Chemical Structure
053-03493	Echloomezol Std., 98.0+% (cGC)	200 mg 2-10	C ₅ H ₅ Cl ₃ N ₂ OS= 247.53 CAS: 2593-15-9 Chemical Name: 5-Ethoxy-3-trichloromethyl-1,2,4-triazazol	Pale yellow, clear liquid	Fungicide m.p.: 20	
053-05193	Ethofenprox Std., 99.0+% (HPLC)	200 mg 2-10	C ₂₅ H ₂₈ O ₃ =376.49 CAS: 80844-07-1 Chemical Name: α-[(p-Ethoxy-β,β-dimethylphenethyl)oxy]-m-phenoxytoluene	White, crystals - crystalline powder	Insecticide m.p.: 35 -38	
054-06821	Ethoxysulfuron Std., 99.0+% (HPLC)	50 mg 2-10	C ₁₅ H ₁₈ N ₄ O ₇ S= 398.39 CAS: 126801-58-9 Chemical Name: 1-(4,6-Dimethoxypyrimidin-2-yl)-3-(2-ethoxyphenoxysulfonyl)urea	White, crystalline powder	Herbicide m.p.: 149.2	
068-04201	Famoxadone Std., 99.0+% (HPLC)	200 mg 2-10	C ₂₂ H ₁₈ N ₂ O ₄ = 374.39 CAS: 131807-57-3 Chemical Name: 3-Anilino-5-(4-phenoxyphenyl)-1,3-oxazolidine-2,4-dione	White, powder	Fungicide m.p.: 142.4-143.3	
069-04111	Fenhexamid Std., 99.0+% (GC)	200 mg 2-10	C ₁₄ H ₁₇ NCl ₂ NO ₂ = 374.39 CAS: 126833-17-8 Chemical Name: N-(2,3-Dichloro-4-hydroxyphenyl)-1-methylcyclohexanecarboxamide	Crystalline powder	Fungicide m.p.: 153	
066-04121	(Z)-Ferimzone Std. 99.0+% (HPLC)	200 mg 2-10	C ₁₅ H ₁₈ N ₄ = 254.33 CAS: 89269-64-7 Chemical Name: (Z)-2'-Methylacetophenone 4,6-Dimethylpyrimidin-2-ylhydrazone	White, powder	Fungicide m.p.: 175-176	
063-04131	(E)-Ferimzone Std. 99.0+% (HPLC)	200 mg 2-10	C ₁₅ H ₁₈ N ₄ = 254.33 CAS: - Chemical Name: (E)-2'-Methylacetophenone 4,6-Dimethylpyrimidin-2-ylhydrazone	Crystalline powder	m.p.: 111-112	
062-04101	Fipronil Std. 98.0+% (GC)	200 mg 2-10	C ₁₂ H ₄ Cl ₂ F ₆ N ₄ OS= 437.15 CAS: 120068-37-3 Chemical Name: (±)-5-Amino-1-(2,6-dichloro-α,α,α-trifluoro-ρ-tolyl)-4-trifluoromethylsulfanylpyrazole-3-carbonitrile	White, crystalline powder - powder	Insecticide m.p.: 200-201	
098-04841	Indanofan Std.	200 mg 2-10	C ₂₀ H ₁₇ ClO ₃ = 340.80 CAS: 133220-30-1 Chemical Name: (R ^S)-2-[2-(3-Chlorophenyl)-2,3-epoxypropyl]-2-ethylidene-1,3-dione	White, crystalline powder - powder	Herbicide m.p.: 61.7	
131-13651	Milbemectin Std., 98.0+% (HPLC)	50 mg 2-10	Milbemycin A ₃ : R = CH ₃ ; Milbemycin A ₄ : R = CH ₂ CH ₃ A ₃ : C ₃₁ H ₄₄ O ₇ = 528.68; A ₄ : C ₃₂ H ₄₆ O ₇ = 542.70; CAS: 51596-10-2 (A ₃); 51596-11-3 (A ₄)	White, crystalline powder - powder	Insecticide m.p.: 212-215	

C. Standards for Residual Pesticide Analysis -Continued-

Wako Cat. No.	Product	Package, Storage	Physical Data	Appearance	Note	Chemical Structure
157-02361	Oxpoconazole Fumarate Std., 99.0+% (HPLC)	200 mg 2-10	C ₄₂ H ₅₂ Cl ₂ N ₆ O ₈ = 839.80	White, powder	Fungicide m.p.: 124.0	
163-20081	Polycarbamate Std., 95.0+%	200 mg 2-10	C ₁₀ H ₁₈ N ₄ S ₈ Zn ₂ = 581.58 CAS: 64440-88-6 Chemical Name: Dizinc Bis (dimethyldithiocarbamate) ethylenebis (dithiocarbamate)	White, crystalline powder - powder	Insecticide	
163-11213	Procymidone Std., 99.0+% (GC)	200 mg 2-10	C ₁₃ H ₁₁ Cl ₂ NO ₂ = 284.14 CAS: 32809-16-8 Chemical Name: <i>N</i> -(3',6'-Dichlorophenyl)-1,2-dimethylcyclopropane-1,2-dicarboxinide	White, crystals	Fungicide m.p.: 164 - 167	
163-19971	Pymetrozine Std.	200 mg 2-10	C ₁₀ H ₁₁ N ₅ O = 217.23 CAS: 123312-89-0 Chemical Name: (<i>E</i>)-4,5-Dihydro-6-methyl-4-(3-pyridylmethyleneamino)-1,2,4-triazin-3(2H)-one	Slightly pale yellow, powder	Insecticide m.p.: 217	
169-19831	Pyraflufen-ethyl Std.	200 mg 2-10	C ₁₅ H ₁₃ Cl ₂ F ₃ N ₂ O ₄ = 413.18 CAS: 129630-19-9 Chemical Name: Ethyl 2-Chloro-5-(4-chloro-5-difluoromethoxy-1-methylpyrazol-3-yl)-4-fluorophenoxyacetate	White, crystalline powder	Herbicide m.p.: 126.4-127.2	
209-15341	Terbacil Std., 99.0+% (cGC)	200 mg 2-10	C ₉ H ₁₃ ClN ₂ O ₂ = 216.66 CAS: 5902-51-2 Chemical Name: 3- <i>tert</i> -Butyl-5-chloro-6-methyluracil	White, powder	Herbicide m.p.: 175.4	
201-08233	Thiophanate-methyl Std., 99.0+% (HPLC)	200 mg 2-10	CAS: 23564-05-8 M.W. 342.39	White, crystalline powder	Fungicide 172 (dec.)	
205-08493	Triadimefon Std., 99.0+%	200 mg 2-10	C ₁₄ H ₁₆ ClN ₃ O ₂ = 293.75 CAS: 43121-43-3 Chemical Name: 1-(4-Chlorophenoxy)-3,3-di-methyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone	White - slightly pale yellow, crystalline powder	Fungicide m.p.: 78 - 84	

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