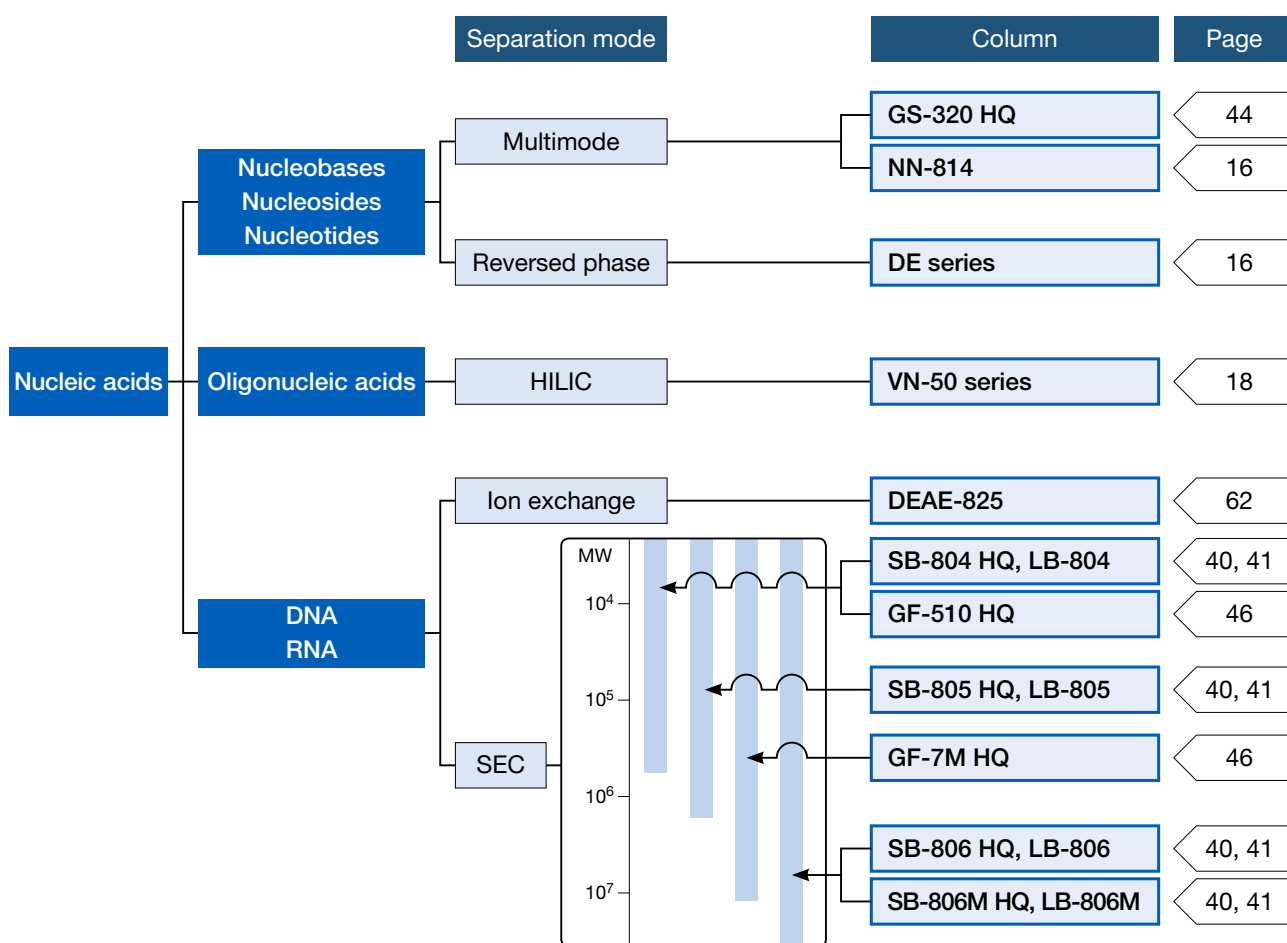


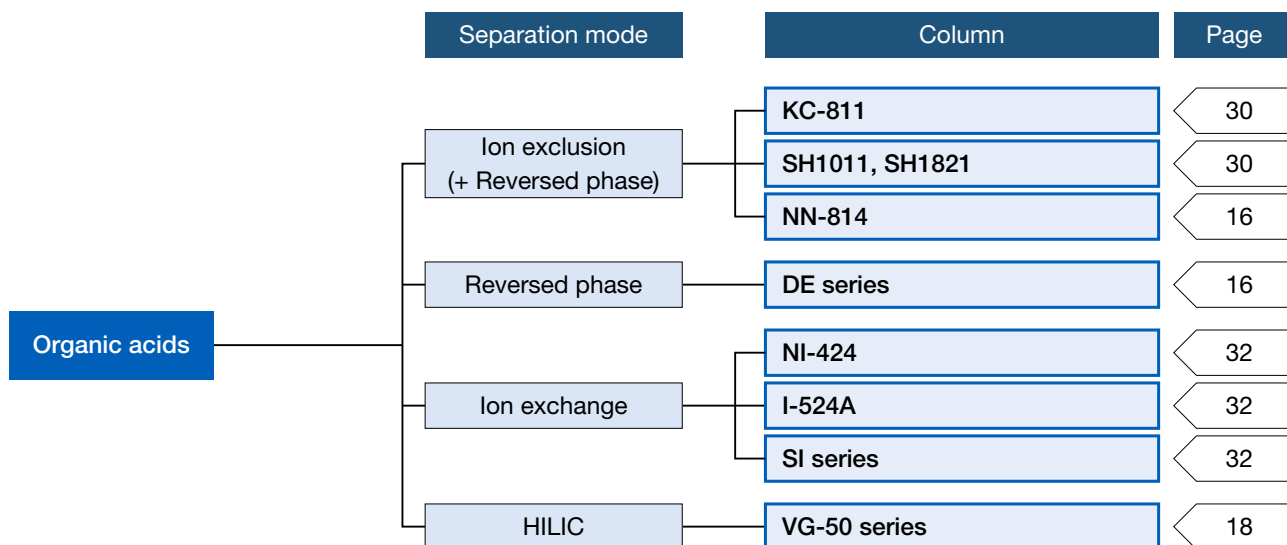
Column Selection (Proteins, Peptides, and Amino Acids)

	Separation mode	Graph	Column	Page
Proteins Peptides	SEC		KW-802.5, KW402.5-4F	36
			LW-803, LW-403 4D	37
			KW-803, KW403-4F	36
			KW-804, KW404-4F	36
			KW405-4F	36
	Reversed phase		DE series	16
			ODP-50 series	14
			C4P-50 4D	14
	HILIC		VC-50 2D	18
			NH2P series	22
	Ion exchange		QA-825	62
			DEAE-825	62
			ES-502N 7C	62
			SP-825, SP-FT 4A	62
			CM-825	62
ES-502C 7C			62	
Multimode		GS-220 HQ	44	
		GS-320 HQ	44	
Amino acids	Ion exchange		NN-814	16
			YS-50	33
			P-421S	62
	Reversed phase		ODP-50 series	14
			VC-50 2D	18
	HILIC		VG-50 series	18
			NH2P series	22

Column Selection (Nucleic Acids)



Column Selection (Organic Acids)



Column Selection (Drugs, Metabolites and Chiral Compounds)

	Separation mode	Column	Page	
Drugs Metabolites	Reversed phase	ODP2 HP	12	
		ODP-50 series, C4P-50 4D	14	
		DS-413, DS-613	16	
		DE series	16	
		C18M, C18U	24	
	HILIC	VC-50 2D	18	
		VT-50 2D	18	
		NH2P series	22	
	Ion exchange	NI-424	32	
		I-524A	32	
		YK-421	33	
		ES-502C 7C	62	
		Multimode	GS-320 HQ	44
	Chiral compounds	Chiral separation	CDBS-453	64

Column Selection (Vitamins, Hormones / Neurotransmitters and Lipids)

	Separation mode	Column	Page
Water-soluble vitamins	Reversed phase	ODP-50 series	14
		DE series	16
		DM-614	16
		C18M, C18U	24
	HILIC	VG-50 series	18
		VT-50 2D	18
		NH2P series	22
Multimode	NN-814	16	
Fat-soluble vitamins	Reversed phase	ODP-50 series	14
		C18M, C18U	24
	SEC	KF-801, KF-401HQ	48, 52
Hormones / Neurotransmitters	Reversed phase	ODP-50 series	14
		DE series	16
		C18M, C18U	24
		SB-802.5 HQ, LB-802.5	40, 41
	HILIC	VC-50 2D	18
		VT-50 2D	18
		NH2P series	22
	Ion exchange	ES-502N 7C	62
		ES-502C 7C	62
Lipids	Reversed phase	ODP-50 series	14
		DS-413, DS-613	16
		DE series	16
	SEC	GF-310 HQ	46
		KF-801, KF-802, KF-802.5	48
		KF-402HQ	52

Polymer-based Reversed Phase Chromatography Columns (ODP2 HP)

<https://www.shodex.de/odp2-hp-columns>

Features

ODP2 HP

- Provides a large theoretical plate number nearly twice as much as generally available polymer-based reversed phase columns do
- Offers enhanced retention of high polar substances compared to ODS columns
- Suitable for the analysis of small molecules such as pharmaceuticals in the presence of protein matrix
- Ideal for LC/MS analysis of high polar compounds
- Fulfills USP-NF L39 requirements

Standard columns

Product Code	Product Name	Plate Number (TP/column)	Functional Group	Particle Size (µm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F7622001	ODP2 HP-4B	≥ 3,500	—	5	40	4.6 x 50	H ₂ O/CH ₃ CN = 55/45
F7622002	ODP2 HP-4D	≥ 10,000	—	5	40	4.6 x 150	H ₂ O/CH ₃ CN = 55/45
F7622003	ODP2 HP-4E	≥ 17,000	—	5	40	4.6 x 250	H ₂ O/CH ₃ CN = 55/45
F6714010	ODP2 HPG-4A	(guard column)	—	5	—	4.6 x 10	H ₂ O/CH ₃ CN = 55/45

Base Material: Polyhydroxymethacrylate

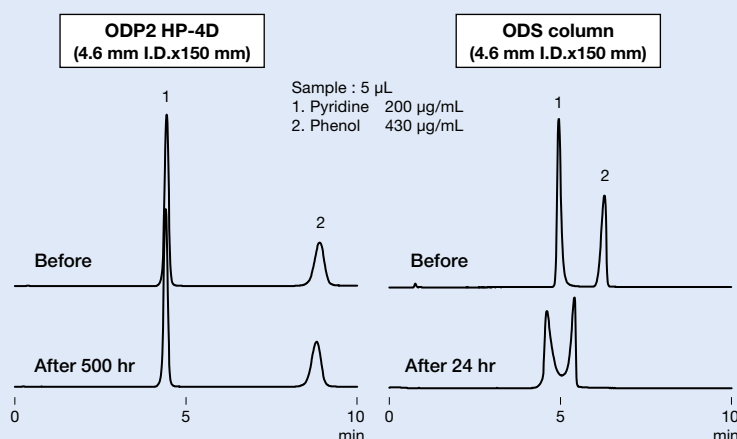
Semi-micro columns

Product Code	Product Name	Plate Number (TP/column)	Functional Group	Particle Size (µm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F7622004	ODP2 HP-2B	≥ 3,000	—	5	40	2.0 x 50	H ₂ O/CH ₃ CN = 55/45
F7622005	ODP2 HP-2D	≥ 7,000	—	5	40	2.0 x 150	H ₂ O/CH ₃ CN = 55/45
F6714011	ODP2 HPG-2A	(guard column)	—	5	—	2.0 x 10	H ₂ O/CH ₃ CN = 55/45

Base Material: Polyhydroxymethacrylate

Comparison between ODP2 HP-4D and an ODS column for their alkaline tolerances

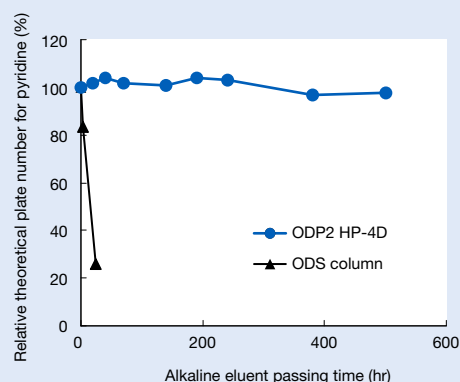
Chromatograms obtained before and after passing alkaline eluent



Analysis condition

Column : Shodex ODP2 HP-4D
ODS column from other manufacturer
Eluent : H₂O/CH₃OH = 70/30
Flow rate : 1.0 mL/min
Detector : UV (254 nm)
Column temp. : 40 °C

Correlation between alkaline eluent passing time and relative theoretical plate number



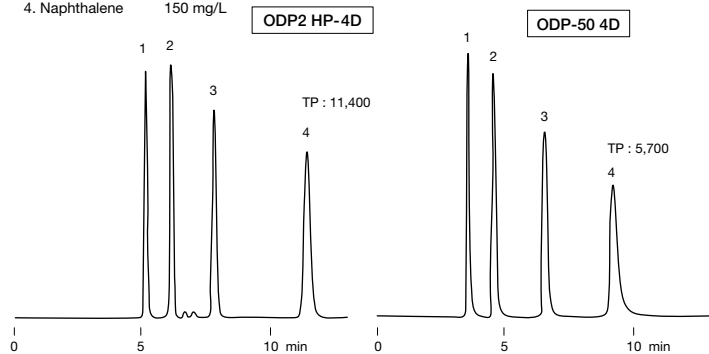
Eluent passing conditions for an alkaline tolerance test

Column : Shodex ODP2 HP-4D
ODS column from other manufacturer
Eluent : 10 mM Sodium phosphate buffer (pH12) /CH₃CN = 45/55
Flow rate : 0.6 mL/min
Column temp. : 30 °C

Comparison between ODP2 HP and ODP-50

 Sample : 5 μ L

1. Phenol 300 mg/L
2. Methyl benzoate 350 mg/L
3. Toluene 1000 mg/L
4. Naphthalene 150 mg/L



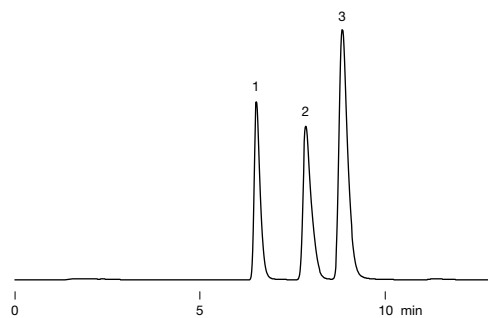
Column : Shodex ODP2 HP-4D
Eluent : H₂O/CH₃CN = 55/45
Flow rate : 0.6 mL/min
Detector : UV (254 nm)
Column temp. : 40 °C

Column : Shodex Asahipak ODP-50 4D
Eluent : H₂O/CH₃CN = 35/65
Flow rate : 0.6 mL/min
Detector : UV (254 nm)
Column temp. : 40 °C

Imidazoles

 Sample : 0.1 % each, 10 μ L

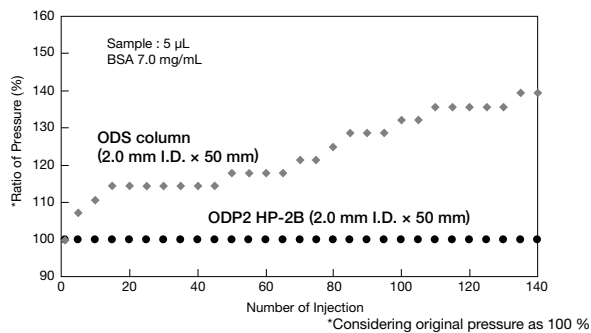
1. Imidazole
2. 2-Methylimidazole
3. 4-Methylimidazole



Column : Shodex ODP2 HP-4E
Eluent : 10 mM Na₂HPO₄ aq./CH₃CN = 90/10
Flow rate : 0.8 mL/min
Detector : UV (220 nm)
Column temp. : 40 °C

Influence of repeated protein injection on column pressure

ODP2 HP columns are packed with gels with increased surface polarity and smaller pore size which prevent the adsorption of proteins. BSA was injected multiple times to both ODS and ODP2 HP columns. A significant column pressure increase was observed for the ODS column, while no considerable change was observed for the ODP2 HP column even after 140 injections.

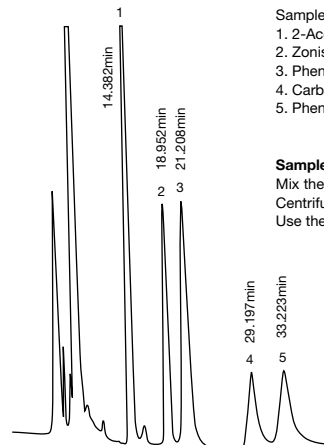


Column : Shodex ODP2 HP-2B
ODS column from other manufacturer
Eluent : 1 mM CH₃COONH₄ aq./CH₃CN = 90/10
Flow rate : 0.2 mL/min
Detector : UV (220 nm)
Column temp. : 30 °C

Anticonvulsant in serum

 Sample : 20 μ L

1. 2-Acetaminophen (I.S.) 10 μ g/mL
2. Zonisamide 13.0 μ g/mL
3. Phenobarbital 19.0 μ g/mL
4. Carbamazepine 4.5 μ g/mL
5. Phenytoin 9.0 μ g/mL

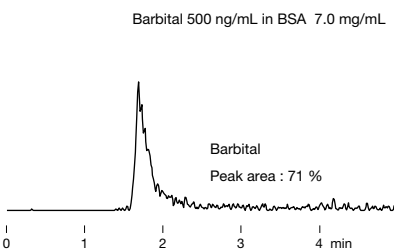
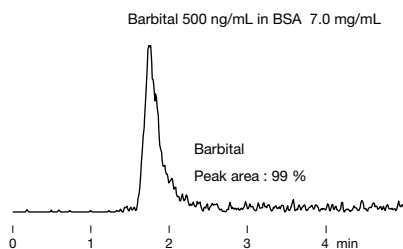
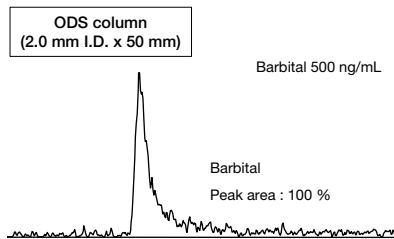
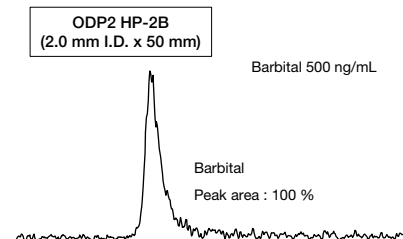

Sample pretreatment:

Mix the same volumes of serum and acetonitrile. Centrifuge the mixture at 6000 x g for 5 minutes. Use the supernatant as sample.

Data provided by Katsuko Hara.MT
 Yutaka Komiya .Ph.D.,
 Department of Clinical Sciences
 and Laboratory Medicine,
 Kansai Medical University.

Column : Shodex ODP2 HP-4E
Eluent : 25 mM Sodium phosphate buffer (pH5.2)/CH₃CN = 680/320
Flow rate : 0.35 mL/min
Detector : UV (210 nm)
Column temp. : 40 °C

Comparison of barbital recovery rate using ODP2 HP-2B and ODS in the presence of BSA



LC/MS analysis of drugs in biological samples is often interfered by ion suppression caused by presence of protein when using general ODS columns. However, ODP2 HP does not retain proteins and elutes them at the void volume. Thus, elution of barbital is not affected when using the ODP2 HP and provides better recovery rate than that of an ODS column.

Column : Shodex ODP2 HP-2B
ODS column from other manufacturer
Eluent : 10 mM CH₃COONH₄ aq./CH₃CN = 70/30
Flow rate : 0.2 mL/min
Detector : ESI-MS (SIM Negative: m/z 183)
Column temp. : 30 °C
Injection vol. : 10 μ L