Hydrosphere C18

- **stable under the use of 100% aqueous eluent**
- **"hydrophilic" C18 surface for enhanced polar recognition**
- **no need for ion pair reagents**
- **based on highly inert, ultrapure, pH neutral silica**

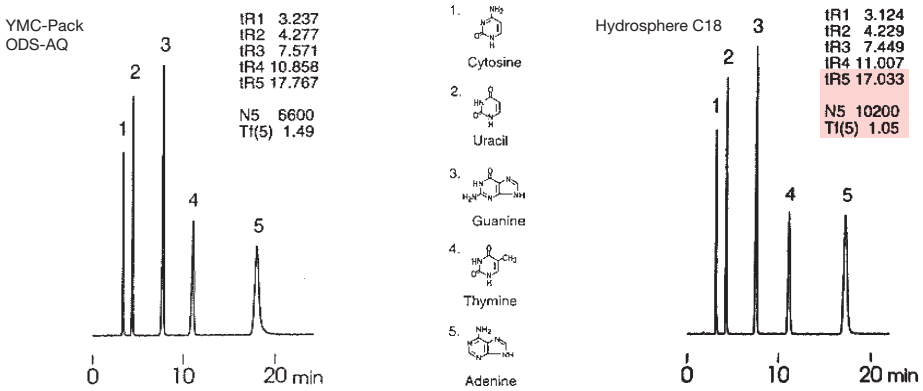
Hydrosphere C18	Specification
Particle size / µm	3; 5
Pore size / nm	12
Surface area / m^2g^{-1}	340
Carbon content / %	12
Recommended pH range	2 - 8

General

The separation of polar compounds in many cases requires highly aqueous mobile phase conditions to achieve sufficient retention on the stationary phase. Conventional reversed phase selectivities do not give reproducible results under these conditions due mainly to the collapse of the C18 chains, Hydrosphere C18 has been developed, on the ultra pure silica support of the *Pro*Family, as the next generation of speciality phases following the well known YMC-Pack ODS-AQ, which was developed in 1987 and is still a very interesting selectivity option for these purposes.

In order to compare the differences and similarities of both reversed phases, nucleic acid bases are separated under pure aqueous eluent conditions on both selectivities. Interestingly uracil, normally used as a dead volume marker, can be retained on both phases, whereas adenine elutes later on YMC-Pack ODS-AQ. This peak on Hydrosphere C18 is virtually symmetrical with a tailing factor of 1.05, but on YMC-Pack ODS-AQ it shows a slightly tailing peak (with a tailing factor of 1.49).

Hydrosphere C18 vs. YMC-Pack ODS-AQ



Column: 150 x 4.6 mm
Eluent: 20mM KH_2PO_4-K_2HPO_4 (pH 6.9)
Flow rate: 1.0 ml/min
Temperature: 37° C
Detection: UV at 254 nm

As a consequence, both Hydrosphere C18 and YMC-Pack ODS-AQ are the selectivities of choice within the YMC portfolio to separate polar compounds when using 100% aqueous eluent conditions. YMC-Pack ODS-AQ shows stronger retention for more hydrophobic substances, while Hydrosphere C18 is ideal for basic substances.

Both selectivities are a "must" for approaching the separation of polar compounds.

Column Kits
MD VAL R&D CC LC-MS
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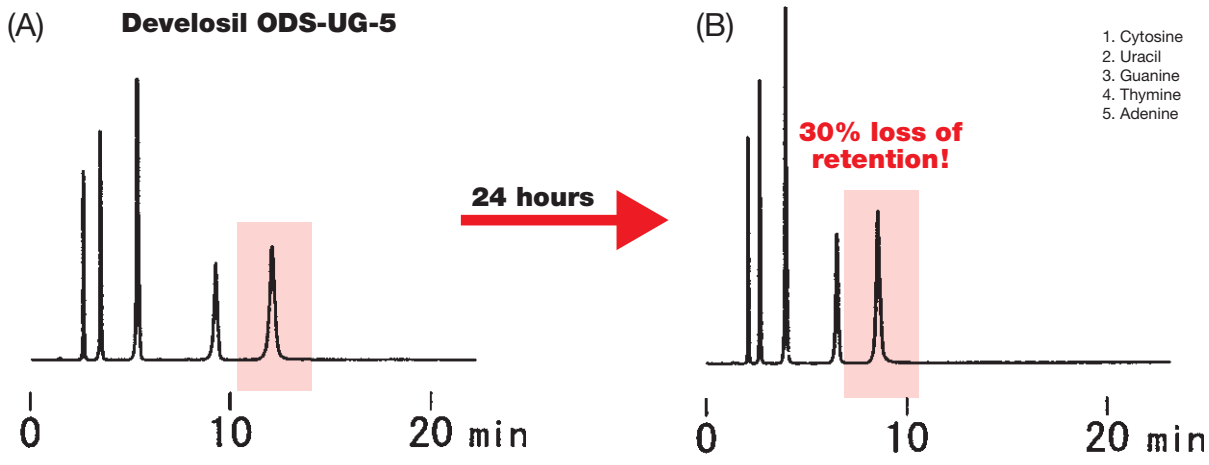
Hydrosphere C18

Properties

A proprietary derivatisation procedure enables Hydrosphere C18 to be penetrated by water without losing its brush-like chain structure. This model of the so-called phase collapse is one explanation for a phenomenon, where the retention times decrease after a very short time under 100% aqueous eluent on a conventional C18 phase.

Here, the retention behaviour of a conventional ODS column and Hydrosphere C18 under 100% aqueous conditions is compared. Its "hydrophilic" C18 surface gives Hydrosphere C18 the capability to show stable retention times even after 24 hours under these chromatographic conditions.

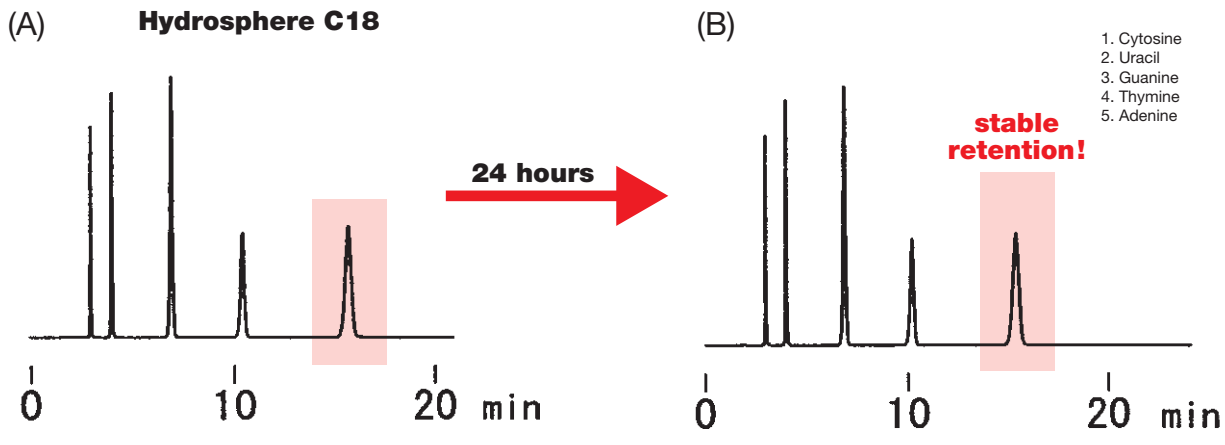
Problem: Conventional ODS under 100% aqueous chromatographic conditions*



Column: 150 x 4.6 mm i.d.
Eluent: 20 mM KH_2PO_4-K_2HPO_4 (pH 6.9)
Flow rate: 1.0 ml/min
Temperature: 37 °C
Detection: UV at 254 nm

After use, the column was stored overnight without any washing procedure. The next day, the application was continued.

Solution: Hydrosphere C18 under 100% aqueous chromatographic conditions*



Column: 150 x 4.6 mm i.d.
Eluent: 20 mM KH_2PO_4-K_2HPO_4 (pH 6.9)
Flow rate: 1.0 ml/min
Temperature: 37 °C
Detection: UV at 254 nm

After use, the column was stored overnight without any washing procedure. The next day, the application was continued.

* By courtesy YMC Co., Ltd.

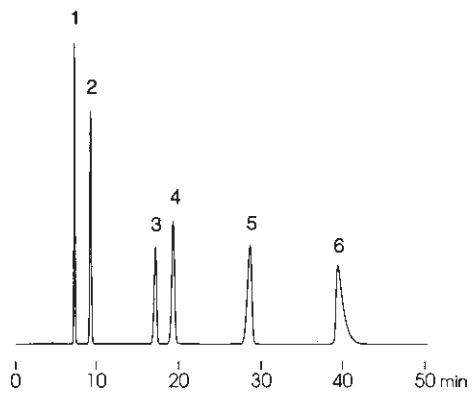
Hydrosphere C18

Here, the properties of YMC-Pack ODS-AQ are compared with YMC-Pack *Pro* C18 and Hydrosphere C18 to show similarities and differences of these three selectivities and to give assistance when choosing the right phase for specific chromatographic purposes.

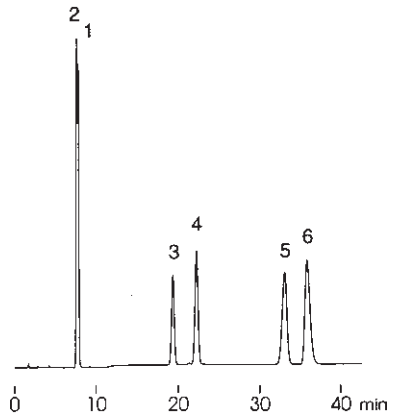
Traditionally, YMC-Pack ODS-AQ was designed for the separation of polar compounds under 100% aqueous conditions and YMC-Pack *Pro* C18 for the separation of acidic and basic substances.

As a consequence, Hydrosphere C18 could be understood as a synergy of the advantages of YMC-Pack ODS-AQ and YMC-Pack *Pro* C18.

YMC-Pack ODS-AQ



YMC-Pack *Pro* C18

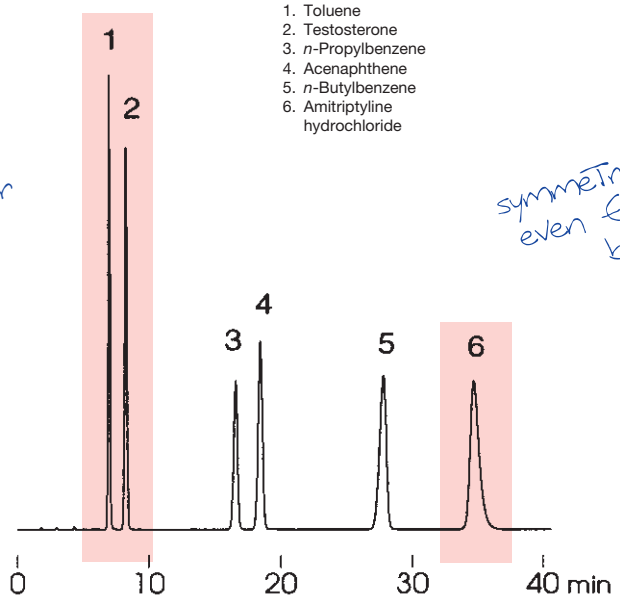


Hydrosphere C18

1. Toluene
2. Testosterone
3. *n*-Propylbenzene
4. Acenaphthene
5. *n*-Butylbenzene
6. Amitriptyline hydrochloride

exceptional polar selectivity

symmetrical peaks even for strong bases

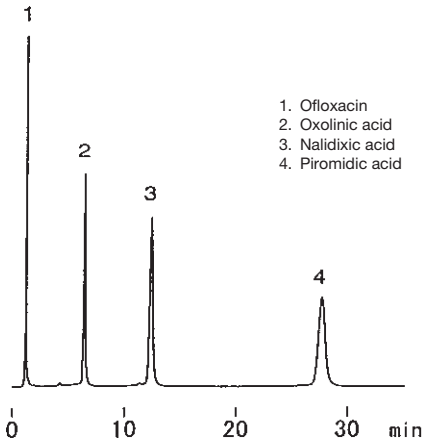


Column:	150 x 4.6 mm i.d.
Eluent:	20mM KH_2PO_4-K_2HPO_4 (pH 6.9)/methanol (35/65)
Flow rate:	1.0 ml/min
Temperature:	37 °C
Detection:	UV at 254 nm

Hydrosphere C18

Finally, Hydrosphere C18 is, in common with all *Pro*Family members, applicable to LC-MS methods as shown below. High throughput LC-MS separations with enhanced flow rates are easily achievable with the 3 µm version of Hydrosphere C18.

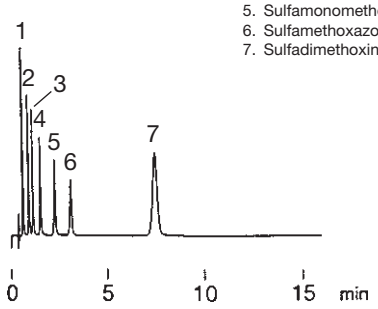
LC-MS compatibility



1. Ofloxacin
2. Oxolinic acid
3. Nalidixic acid
4. Piromidic acid

Column:	Hydrosphere C18 (3 µm, 100 x 2.0 mm)
Eluent:	10 mM CH_3COOH - CH_3COONH_4 (pH 4.3) / acetonitrile (75/25)
Flow:	0.2 ml/min
Detection:	UV at 260 nm
Temperature:	37 °C

High throughput separation

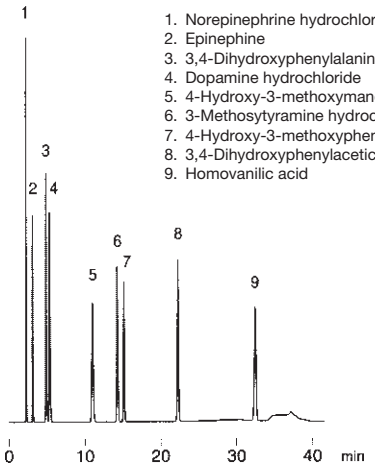


1. Sulfisomidine
2. Sulfathiazole
3. Sulfamerazine
4. Sulfadimidine
5. Sulfamonomethoxine
6. Sulfamethoxazole
7. Sulfadimethoxine

Column:	Hydrosphere C18 (3 µm, 50 x 3.0 mm)
Eluent:	10 mM CH_3COOH - CH_3COONH_4 (pH 4.6) / acetonitrile (85/15)
Flow:	1.0 ml/min
Detection:	UV at 275 nm
Temperature:	37 °C

Hydrosphere C18 is the column of choice within the YMC portfolio for a wide range of different substances. As an almost "universal" selectivity it can be used under standard reversed phase conditions as well as pure aqueous eluents as demonstrated by this collection of applications.

No ion pair reagent required

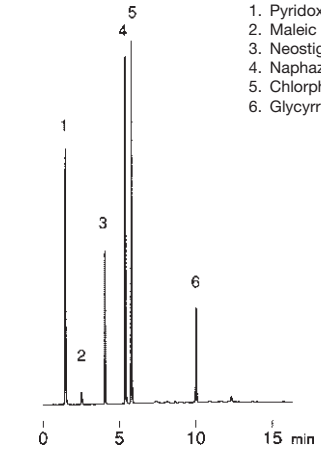


1. Norepinephrine hydrochloride
2. Epinephine
3. 3,4-Dihydroxyphenylalanine (DOPA)
4. Dopamine hydrochloride
5. 4-Hydroxy-3-methoxymandelic acid
6. 3-Methosytyramine hydrochloride
7. 4-Hydroxy-3-methoxyphenylglycol
8. 3,4-Dihydroxyphenylacetic acid
9. Homovanilic acid

Catecholamines

Column:	Hydrosphere C18 (5 µm, 12 nm, 150 x 4.6 mm)
Eluent:	A) 50mM KH_2PO_4 - H_3PO_4 (pH 3.1) B) 50mM KH_2PO_4 - H_3PO_4 (pH 3.1) / acetonitrile (90/10) 0% B (0-5 min), 0-100% B (5-25 min, linear), 100% B (25-35 min)
Flow:	1.0 ml/min
Detection:	UV at 280 nm, 0.64 AUFS
Temperature:	30 °C
Injection:	10 µl (0.15 - 0.25 mg/ml)

Efficient separation of complex substance mixtures



1. Pyridoxine HCl
2. Maleic acid
3. Neostigmine methylsulfate
4. Naphazoline HCl
5. Chlorpheniramine
6. Glycyrrhizin

Ingredients in an eye drop

Column:	Hydrosphere C18 (3 µm, 12 nm, 50 x 4.6 mm)
Eluent:	A) 20mM KH_2PO_4 - H_3PO_4 (pH 2.5) B) acetonitrile 0-60% B (0-10 min), 60% B (10-15 min)
Flow rate:	1.0 ml/min
Temperature:	37 °C
Detection:	UV at 265 nm, 0.128 AUFS
Injection:	5 µl (0.03 - 0.3 mg/ml)

For more applications please refer to our "Application Data Collections" or contact us directly.

Column care

Hydrosphere C18 is stable towards hydrolysis between pH 2 - 8 in up to 100% aqueous systems and a maximum of 50 °C. Remove acid and buffer salts before storage. Store the column in methanol / water = 70/30.

For detailed information please refer to the "Column Care and Use Instructions" which are shipped with each analytical column.