HPLC DATA SHEET

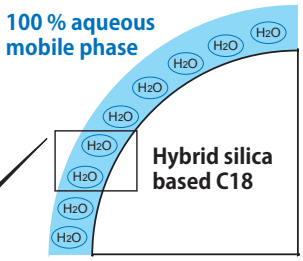
Hybrid silica based C18 column that is stable under the use of 100% aqueous mobile phase - YMC-Triart C18 -

Q130215AE

Retention stability under 100% aqueous mobile phase

Under the 100% aqueous mobile phase, conventional C18 columns generally show poorer performance (retention and peak shape) due to low surface hydration caused by repulsion between aqueous mobile phase and hydrophobic boned phase. Several columns that are compatible with 100% aqueous mobile phase in the market. Such columns exhibit excellent reproducibility and good retention ability of polar compounds achieved by sufficient surface hydration. On the other hand, classical silica base resin and bonded phase are easily degraded under such highly aqueous condition. Those aqueous compatible columns tend to have short lifetime.
YMC-Triart C18 is a highly durable C18 column with polymerically bonded C18 phase on the organic/inorganic hybrid silica. YMC-Triart C18 is designed to retain both moderate hydrogen bonding capacity and hydrophobicity on the surface by optimizing bonded density of C18 phase. Its versatility is ideal for the first choice ODS column, and also applicable to analyses of polar compounds with 100% aqueous mobile phase condition.

Image of C18 surface



Excellent retention stability of Triart C18

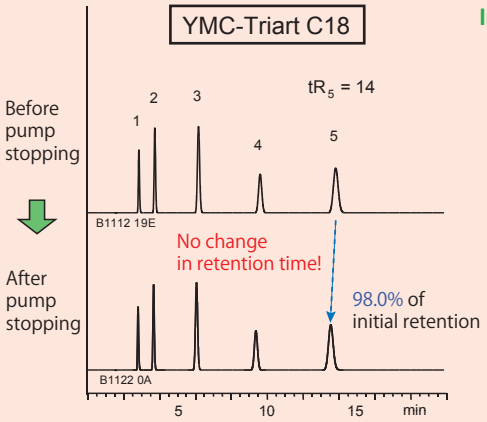
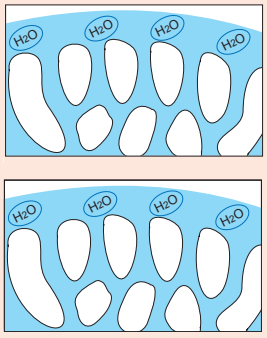
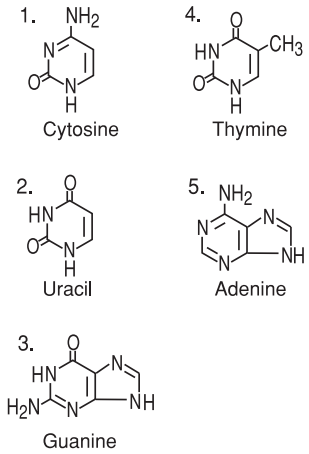


Image of C18 surface hydration



The surface of YMC-Triart C18 is well-hydrated even after stopping pump. This provides longer and stable retention time of polar nucleic bases.

Nucleic bases



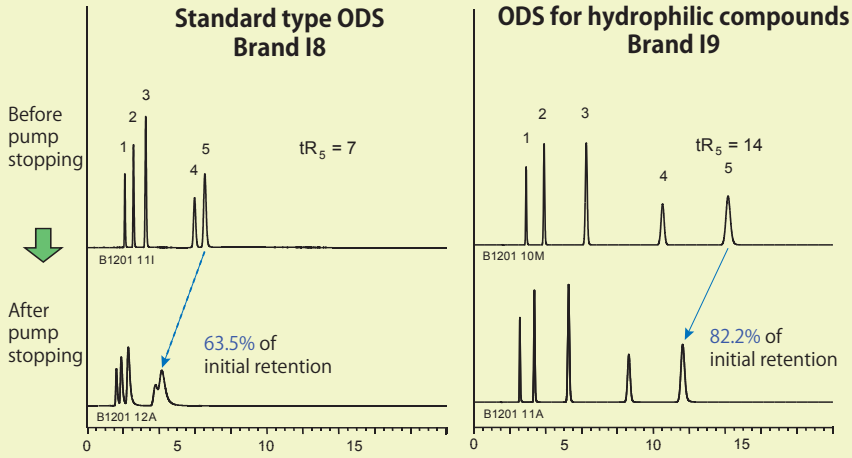
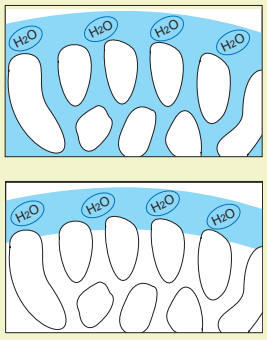


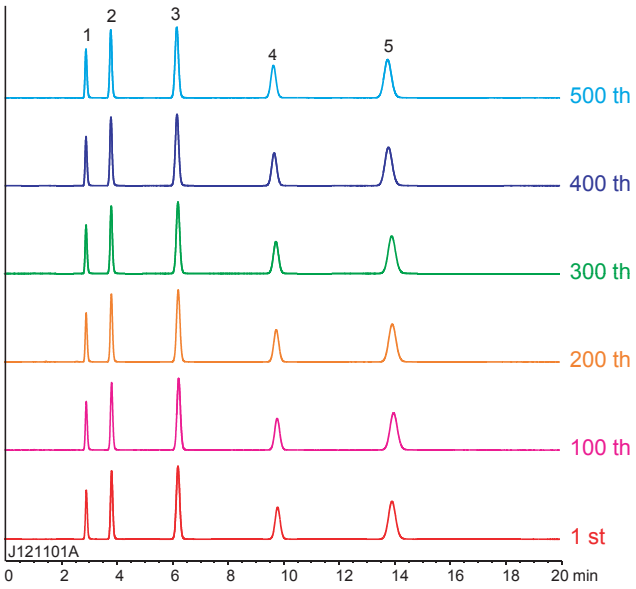
Image of C18 surface hydration

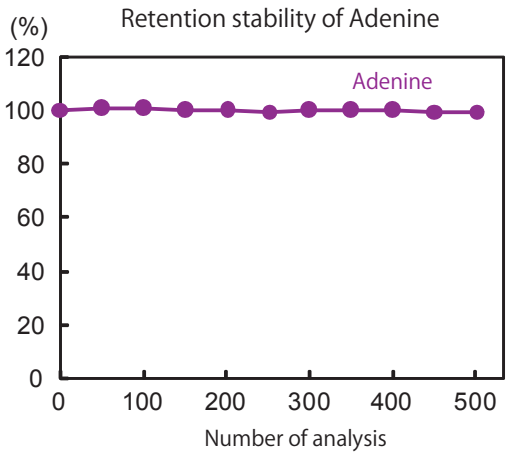


Column	: 5 µm, 150 X 4.6 mmI.D. or 5 µm, 150 X 3.0 mmI.D.
Eluent	: 20 mM KH_2PO_4-K_2HPO_4 (pH 6.9)
Flow rate	: 1.0 mL/min for 4.6 mmI.D. 0.425 mL/min for 3.0 mmI.D.
Temperature	: 37℃
Detection	: UV at 254 nm

In contrast to Triart C18, Brand I8 shows shorter retention and poor retention stability after stopping pump. Brand I9, which is designed for polar compounds and claimed that it can be used with 100% aqueous mobile phase, also exhibits poor retention stability after stopping pump. This phenomenon is caused by poor hydration of those phases. Polar compounds cannot be well-distributed between mobile phase and stationary phase.

Reproducibility on Triart C18





Nucleic bases

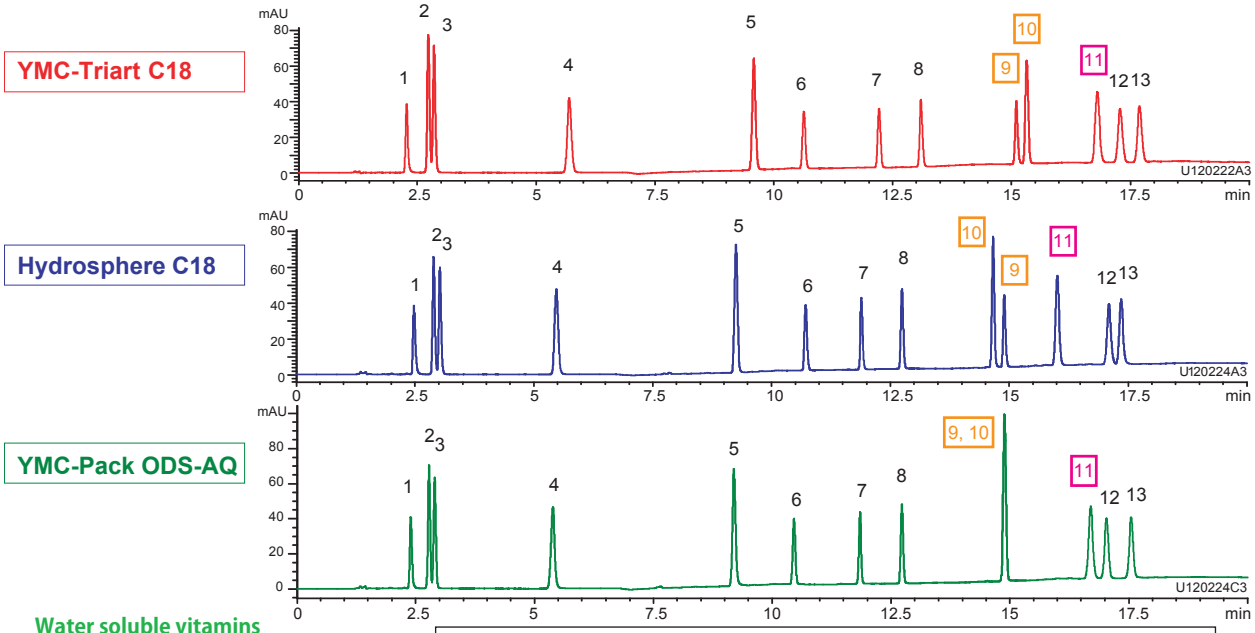
1. Cytosine
2. Uracil
3. Guanine
4. Thymine
5. Adenine

Column	: YMC-Triart C18 5 µm, 150 X 3.0 mmI.D.
Eluent	: **20 mM KH_2PO_4-K_2HPO_4 (pH 6.9)**
Flow rate	: 0.425 mL/min
Temperature	: 37℃
Detection	: UV at 254 nm

No change is found in separation characteristics of Triart C18 including retention time even after 500 runs.

Water soluble vitamins

Comparison of three YMC phases that can be used with 100% aqueous



Water soluble vitamins

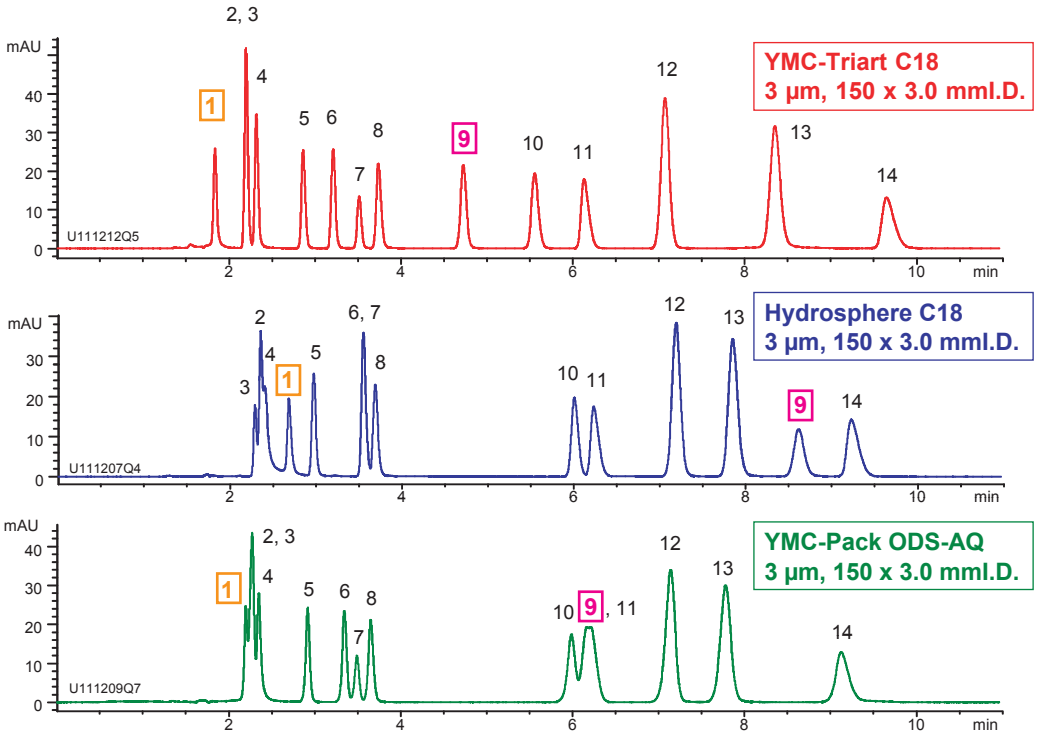
1. L-Ascorbic acid 2-glucoside
2. L-Ascorbic acid
3. D-Isoascorbic acid
4. Nicotinic acid
5. Nicotinamide
6. D-(+)-Pantothenic acid calcium salt
7. Pyridoxal hydrochloride
8. Pyridoxine hydrochloride
9. Foric acid
10. Thiamine hydrochloride
11. Cyanocobalamin
12. D-Biotin
13. Riboflavin

Column	: 3 µm, 150 X 3.0 mmI.D.
Eluent	: **A) 20 mM KH_2PO_4-H_3PO_4 (pH 2.8) containing 5 mM $CH_3(CH_2)_5SO_3Na$**
	B) 20 mM KH_2PO_4-H_3PO_4 (pH 2.8)/acetonitrile (80/20) containing 5 mM $CH_3(CH_2)_5SO_3Na$
	0%B (0-3 min), 0-75%B (3-13 min), 75%B (13-20 min)
FLow rate	: 0.425 mL/min
Temperature	: 40℃
Detection	: 210 nm

Retention behavior of water soluble vitamins on three YMC ODS phases that can be used with 100% aqueous mobile phase is compared. Retention time and elution order of Folic acid (peak 9), Thiamine hydrochloride (peak 10), and Cyanocobalamin (peak 11) are different among three phases. This is because the balance of hydrophobicity and hydrogen bonding capacity differs from column to column.

Organic acids

Comparison of three YMC phases that can be used with 100% aqueous



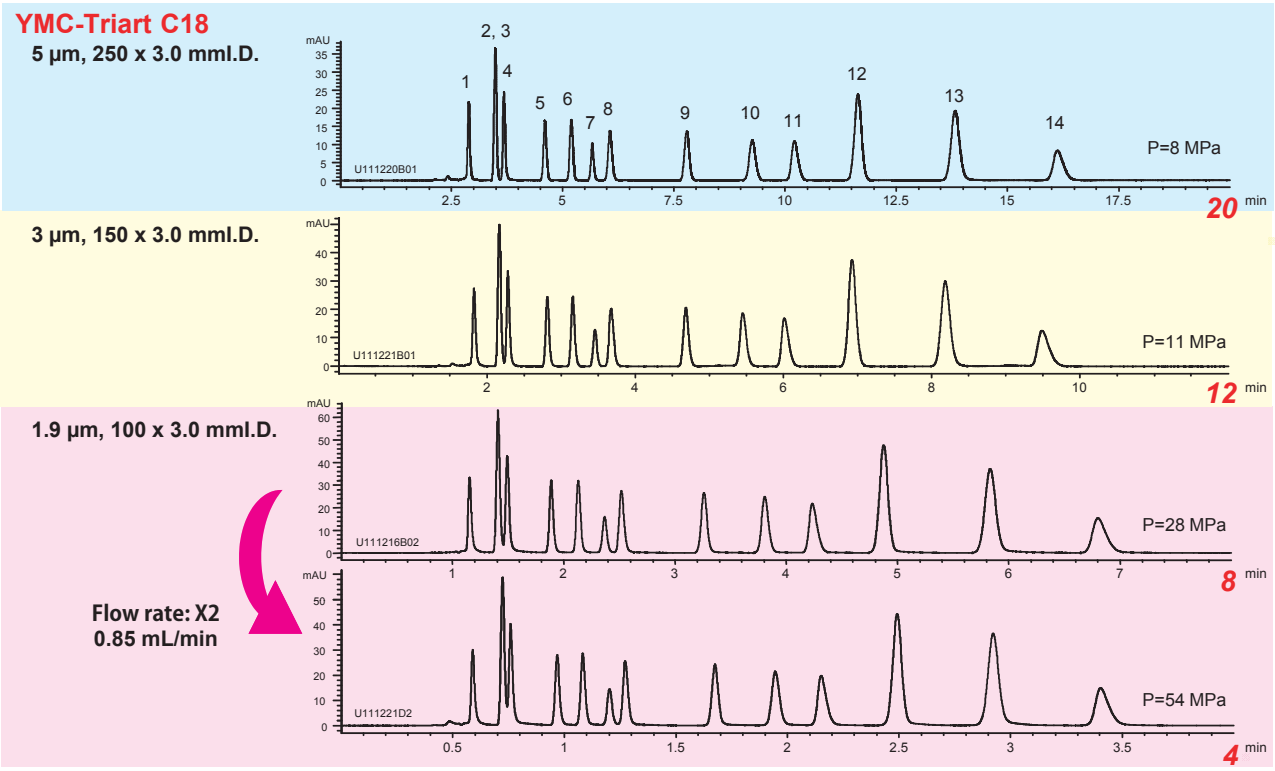
Organic acids

1. Oxalic acid
2. Tartaric acid
3. Glycolic acid
4. Formic acid
5. L-Malic acid
6. Malonic acid
7. Lactic acid
8. Acetic acid
9. Maleic acid
10. Citric acid
11. Succinic acid
12. Fumaric acid
13. Acrylic acid
14. Propionic acid

Eluent	: 20 mM H_3PO_4
FLow rate	: 0.425 mL/min
Temperature	: 37℃
Detection	: 220 nm

Retention behavior of organic acids on three YMC ODS phases that can be used with 100% aqueous mobile phase is compared. Retention time and elution order of Oxalic acid (peak 1) and Maleic acid (peak 9), which have relatively high acidity, are different among three phases. This is attributed to weak anion exchange effect on Hydrosphere C18 and ODS-AQ.

Method transfer between UHPLC and HPLC



Identical chromatographic performance including peak shape and selectivity of Triart C18 column across different particle sizes provides mutual method transfer between UHPLC and HPLC. This feature is ideal for ultrafast method development, and following method transfer to HPLC.