YMC30

- C30 chains
- very lipophilic
- exceptional selectivity pattern
- isomer recognition

- polar carotenes
- polar and nonpolar Xanthophylls
- steroids
- retinols
- fat-soluble vitamins
- LC-MS applications

YMC30	Specification
Particle size / µm	3; 5*
Pore size / nm	proprietary
Surface area / m^2g^{-1}	proprietary
Carbon content / %	proprietary
Recommended pH range	2 - 6

* Preparative grade material with 15 µm particle size is available on request.

General

The separation of geometric and positional isomers is a challenging task in reversed phase chromatography. Subtle molecular differences have to be recognized and resolved by the particular stationary phase. Sander et al. have conclusively shown that polymeric C30 HPLC stationary phases are able to discriminate isomeric structures of long chain molecules [1,2].

Properties

Compared to classical C18 stationary phases, YMC30 is much more hydrophobic. Even when pure organic eluents are applied, many sample solutes are retained. The use of non-aqueous reversed phase mobile phases facilitates 100 % solvent recycling and LC-MS applications.

The YMC30 stationary phase provides sufficient phase thickness to enhance interaction with long chained molecules (fig. 1). Therefore, geometric and positional isomers of conjugated double bonding systems are recognised and resolved by the YMC30 phase.

The resolving power of YMC30 for isomers can be verified by the separation of carotenoids, which has been subject of considerable research efforts in the past. Carotenoids are found in a variety of natural sources including fruits and vegetables. In addition, carotenoids are considered as potential drugs for cancer intervention or prevention. Despite the complexity of carotenoid extracts and the minor shape differences between carotenoid isomers, the separation, identification and quantification of these compounds can be achieved by using YMC30 columns.

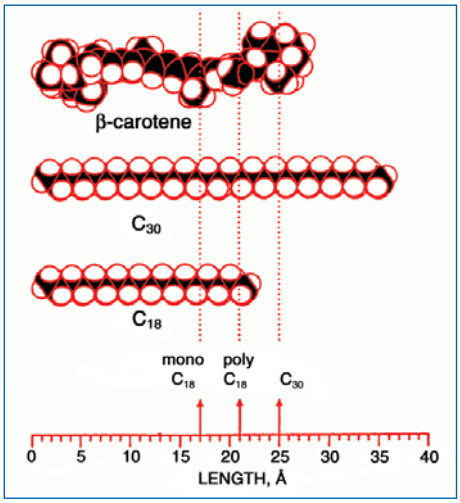


Fig. 1: Comparison of the film thickness of C18 and C30 stationary phases with the molecular length of β-carotene (determined with Small Angle Neutron Scattering (SANS)).

Column Kits
MD VAL R&D CC LC-MS
pages 10 - 19

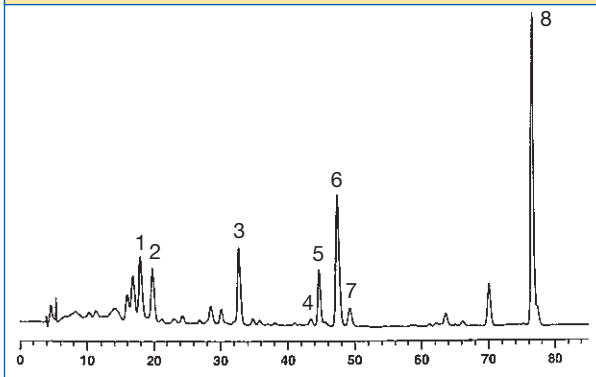
Applications

YMC30 columns are successfully used in the food industry, for the analysis of vitamin formulations, in environmental analysis, and for the control of the growth of algae. Other potential applications include the separation of prostaglandins or leucotrienes.

YMC30

Separation of natural compounds

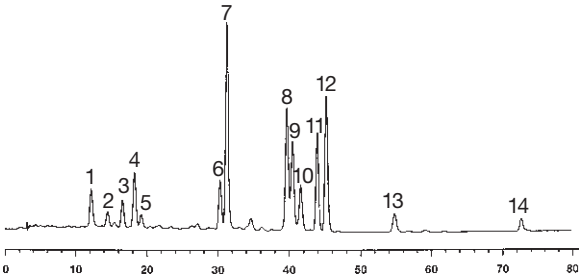
Extract of SRM 2383, NIST food standard [a]



1: Lutein
2: Zeaxanthin
3: β-Cryptoxanthin
4: 13-cis β-Carotene
5: α-Carotene
6: trans β-Carotene
7: 9-cis β-Carotene
8: Lycopene

Column:	YMC30, 250 x 4.6 mm
Eluent:	A: MeOH/MTBE/H_2O = 81/15/4 / B: MeOH/MTBE/H_2O = 6/90/4
Gradient:	100/0 - 0/100 in 90 min
Flow:	1.0 ml/min
Detection:	UV at 450 nm
Temperature:	ambient

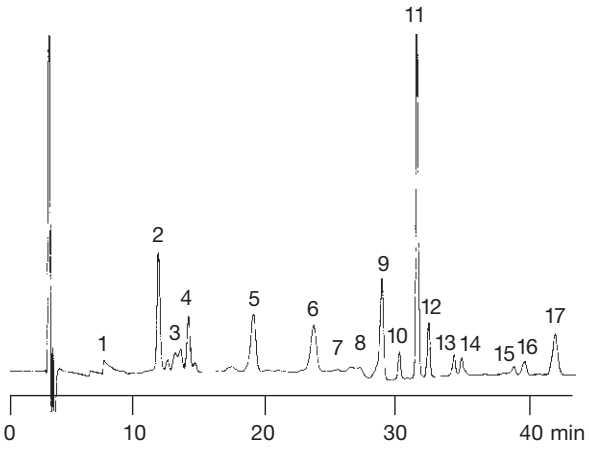
Carotene and Xanthophyll standard [a]



1: Astaxanthin
2: Capsanthin
3: Lutein
4: Zeaxanthin
5: Canthaxanthin
6: β-Cryptoxanthin
7: Echinenone
8: 15-cis β-Carotene
9: 13-cis β-Carotene
10: α-Carotene
11: trans β-Carotene
12: 9-cis β-Carotene
13: δ-Carotene
14: Lycopene

Column:	YMC30, 250 x 4.6 mm
Eluent:	A: MeOH/MTBE/H_2O= 81/15/4 / B: MeOH/MTBE/H_2O= 6/90/4
Gradient:	1-100 % B (90 min)
Flow:	1.0 ml/min
Detection:	UV at 450 nm
Temperature:	ambient

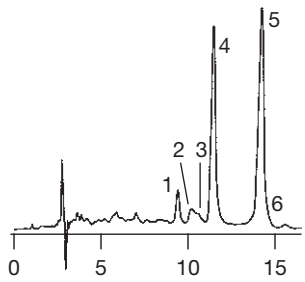
Carotenoid pigments in algae [b]



1: Chlorophyll c_1+c_2
2: Fucoxanthin
3: Neoxanthin
4: Violaxanthin
5: Diadinoxanthin
6: Lutein
7: Zeaxanthin
8: Diatoxanthin
9: Chlorophyll b_x
10: Chlorophyll b_y
11: Chlorophyll a_x
12: Chlorophyll a_y
13: β-Cryptoxanthin
14: Echinenone
15: Phaephorbid b
16: α-Carotene
17: β-Carotene

Column:	YMC30, 250 x 4.6 mm
Eluent:	A: MeOH/acetone = 60/40 B: acetone/H_2O = 60/40
Gradient:	60-30 % B (0-3 min), 30 % B (3-22 min), 30-10 % B (22-26 min), 10 % B (26-41.5 min), 10-60 % B (41.5-45 min)
Flow:	0.5 ml/min
Detection:	UV at 450 nm
Temperature:	35 °C

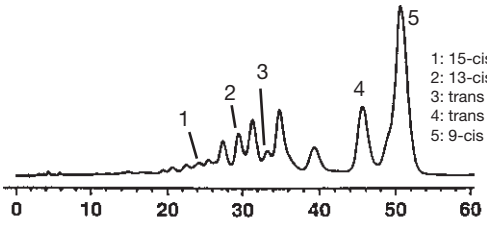
Carotene isomers from commercially available capsules [a]



1: 15-cis β-Carotene
2: 13-cis β-Carotene
3: 13´-cis β-Carotene
4: α-Carotene
5: β-Carotene
6: α-Carotene

Column:	YMC30, 250 x 4.6 mm
Eluent:	EtOH/MeOH/THF = 75/20/5
Flow:	1.0 ml/min
Detection:	UV at 450 nm
Temperature:	ambient

Carotenes found in algae [a]



1: 15-cis β-Carotene
2: 13-cis β-Carotene
3: trans α-Carotene
4: trans β-Carotene
5: 9-cis β-Carotene

Column:	YMC30, 250 x 4.6 mm
Eluent:	MeOH/MTBE = 80/20
Flow:	2.0 ml/min
Detection:	UV at 450 nm
Temperature:	3 °C

References
[1] Sander, L.C. and S.A. Wise; *J. Chromatogr*. 1993, *656*, 335-351
[2] Sander, L.C. et al.; *Anal. Chem*. 1994, *66*, 1667-1674
[3] Block, G. and L. Langseth, "Antioxidant Vitamins and Disease Prevention", *Food Technology* July 1994

[a] Courtesy of L.C. Sander, NIST, Gaithersburg, NC, USA
[b] Courtesy of J. Schmid, Institut für Seenforschung, Langenargen, Germany

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

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