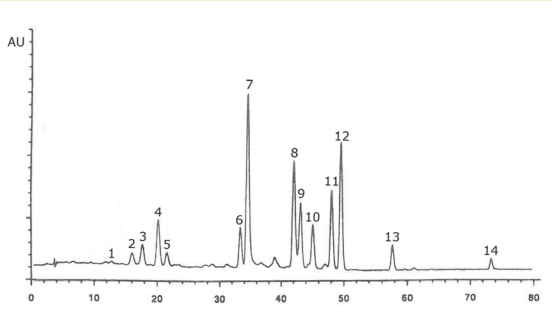
Separation of Carotenoids

Use of shape selectivity to resolve similar compounds



Note: Carotenoids are a broad class of more than 600 compounds. They can be divided into two types: xanthophylls and carotenes. Xanthophylls contain oxygen in their structure and get their name from the Greek words *xanthos* (yellow) and *phyllon* (leaf). Carotenes are unsaturated hydrocarbons which do not contain other elements in their structure.

Method Conditions

Column: Cogent C30™, 5µm, 200Å

Catalog No.: 71030-25P

Dimensions: 4.6 x 250 mm

Mobile Phase: A: 81/15/4 methanol / MTBE / DI H_2O (v/v)
B: 6/90/4 methanol / MTBE / DI H_2O (v/v)

Gradient:

time (min.)	%B
0	0
90	100

Temperature: 20˚C

Flow rate: 1.0mL/min

Detection: UV 450 nm

Sample: Reference standards of each analyte in a mixture.

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

Discussion

Compounds of the carotenoid family are very lipophilic and often have subtle differences in structure. Resolution of these compounds can be difficult with a typical C8 or C18 column because of the similarities. The Cogent C30 stationary phase on the other hand can further differentiate by analyte shape in addition to reversed phase interactions. At lower temperatures, the long alkyl chains become more rigid and steric effects become significant, leading to greater selectivity.

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