LT065

GL Sciences Inc.

Analysis of Phenolic Antioxidants in Food by HPLC (2)

This note describes a determination method for phenolic antioxidants using an Inertsil Ph-3 column, in which phenyl groups chemically bonded directly to porous silica particles.

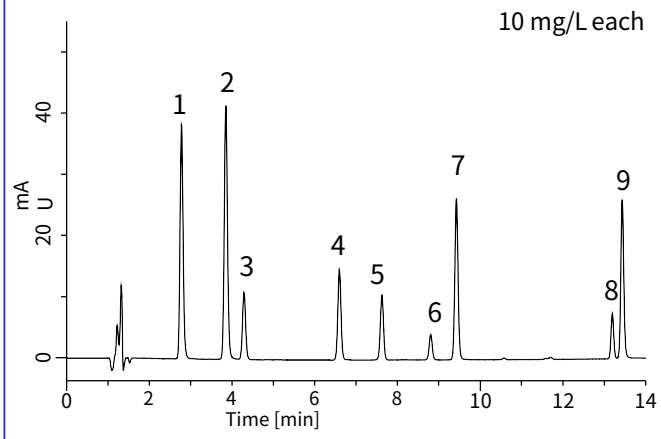
In a previous note (No.64), sufficient separation of the antioxidants was achieved by an ODS column coupled with gradient elution of mobile phase. However, if an interfering peak is detected near an analyte peak or an unknown peak is required to be identified, it is necessary to use another column in which stationary phase is modified with different functional groups.

In this note, Inertsil Ph-3 was chosen among reversed-phase HPLC columns. As well as good separation of the antioxidants was obtained, elution order was significantly changed owing to the interaction between π electrons of the benzene rings bonded to the column particles and the aromatic analytes.

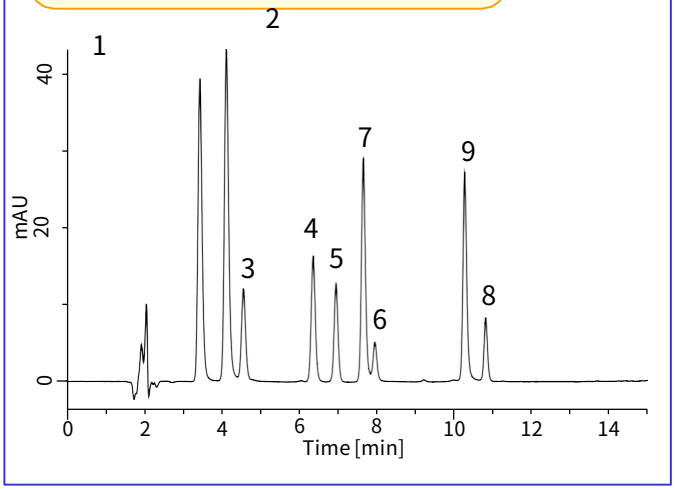
(K.Suzuki)

Chromatograms obtained from standard solution

Inertsil ODS-SP (Flow rate: 1.5 mL/min)



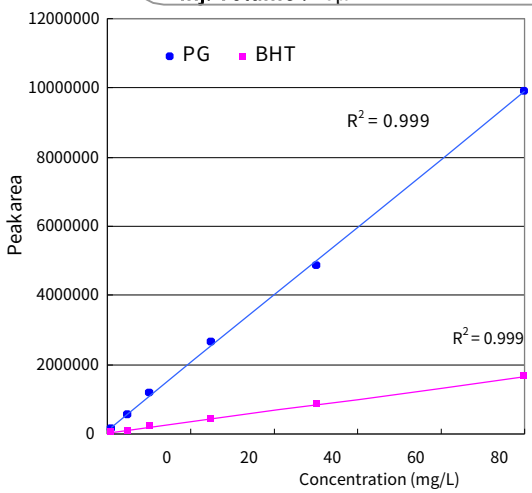
Inertsil Ph-3 (Flow rate: 1.0 mL/min)



1. Propyl gallate (PG)
2. 2,4,5-Trihydroxybutyrophenone (THBP)
3. *tert*-Bubylhydroquinone (TBHQ)
4. Nordihydroguaiaretic acid (NDGA)
5. Butylated Hydroxyanisole (BHA)
6. 4-Hydroxymethyl-2,6-di-*tert*-butylphenol (HMBP)
7. Octyl gallate (OG)
8. Butylated hydroxytoluene (BHT)
9. Dodecyl gallate (DG)

Conditions

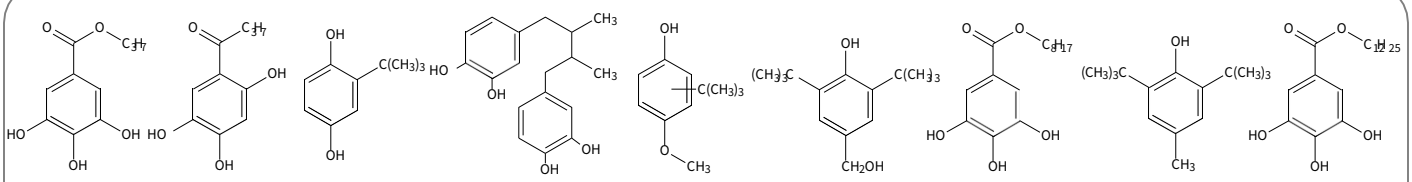
Column : (5 µm, 150 x 4.6 mm I.D.)
Eluent : A) CH_3OH
B)CH_3CN
C)5 % Acetic acid
A/B/C = 20/20/60 — 15 min — 50/50/0 (Equilibration for 10 min), v/v/v
(Mixed by a gradient mixer)
Col. Temp. : 40 °C
Detection : PDA 280 nm
Inj. Volume : 10µL



	R^2
2. THBP	0.999
3. TBHQ	0.993
4. NDGA	0.999
5. BHA	0.999
6. HMBP	0.999
7. OG	0.999
9. DG	1.000

Calibration curves and correlation coefficients (Column: Inertsil Ph-3)

Chemical Structures



1. PG 2. THBP 3. TBHQ 4. NDGA 5. BHA 6. HMBP 7. OG 8. BHT 9. DG

Structures are created using Chemistry 4-D Draw which is provided by ChemInnovayion Software, Inc.

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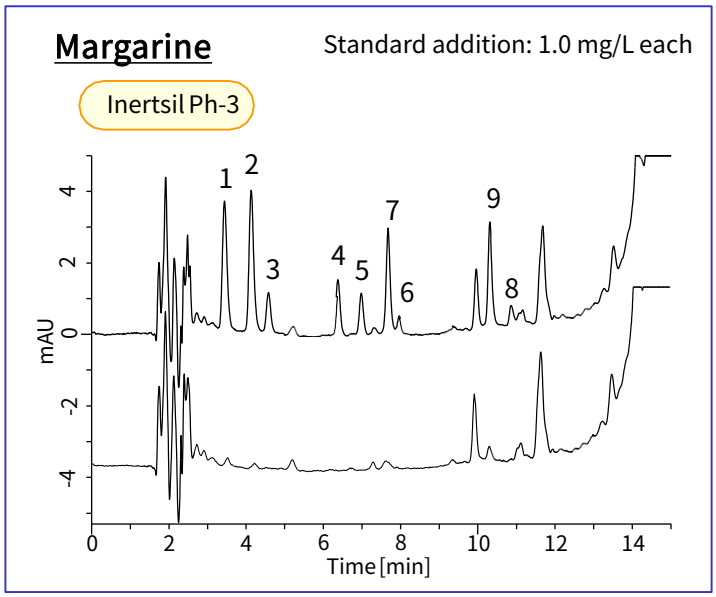
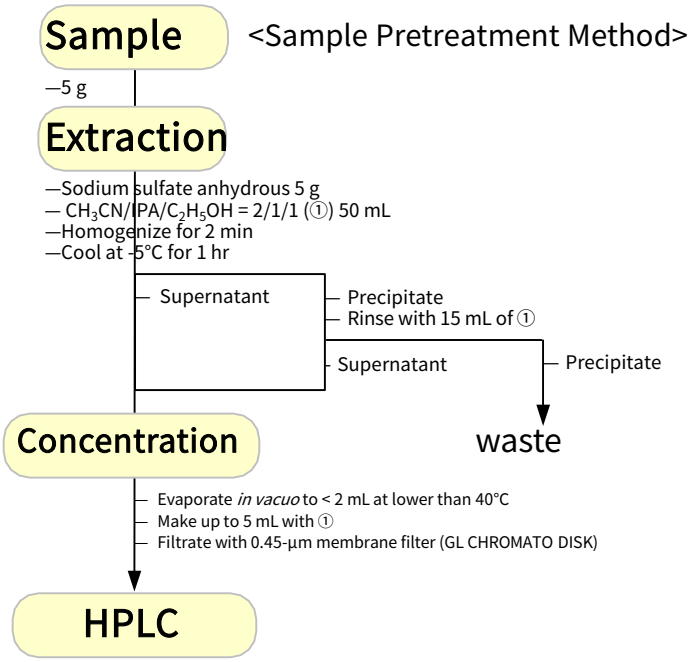
A chromatogram obtained from food sample





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