



COSMOSIL

# Vitamin Analysis by HPLC

Technical Note

Vitamins are trace-amount organic compounds that regulate physiological functions of an organism. Vitamins are classified into two main groups, water-soluble and fat-soluble. Excellent High Performance Liquid Chromatography (HPLC) analyses of vitamins can be achieved by using COSMOSIL 5C<sub>18</sub>-MS-II, PAQ, Cholester or πNAP columns.



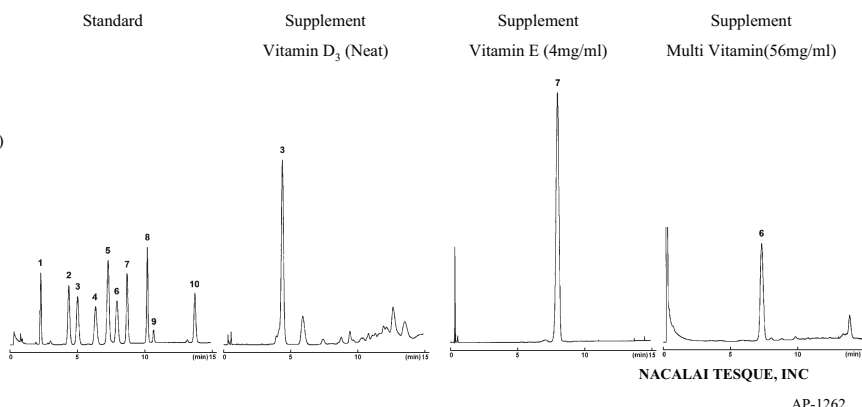
## Fat-soluble Vitamins

### (1) Fat-soluble Vitamins

- Supplement analysis by COSMOSIL 2.5 Cholester column

#### COSMOSIL Application Data

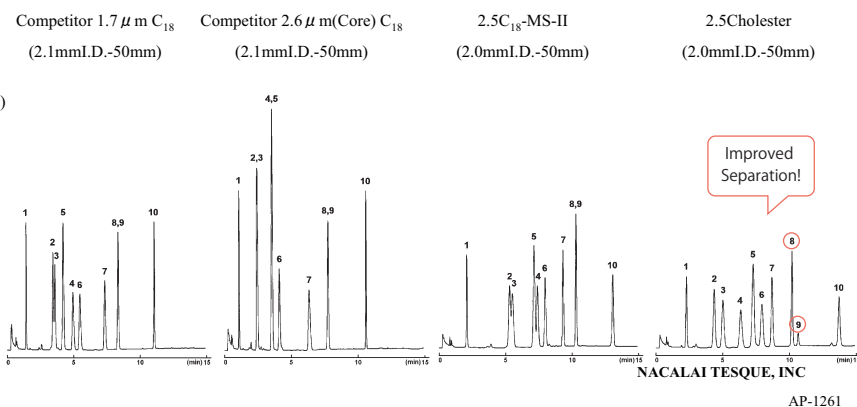
Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 0.1% TFA-Methanol/ H<sub>2</sub>O = 90/10  
 B; 0.1% TFA-Methanol  
 B conc. 0%(0-5min)-100%(10min)-100%(15min)  
 Flow rate: 0.4 ml/min  
 Temperature: 40°C  
 Detection: UV280nm  
 Sample:  
 1: Vitamin A Acetate, *all trans* (0.06mg/ml)  
 2: Vitamin D<sub>2</sub> [Calciferol] (0.30mg/ml)  
 3: Vitamin D<sub>3</sub> (0.06mg/ml)  
 4: Vitamin E Succinate [*D*-α-Tocopherol Succinate] (0.60mg/ml)  
 5: Vitamin K<sub>2</sub> (0.18mg/ml)  
 6: Vitamin E [*DL*-α-Tocopherol] (0.60mg/ml)  
 7: Vitamin E Acetate [*DL*-α-Tocopherol Acetate] (0.60mg/ml)  
 8: *trans*-Vitamin K<sub>1</sub> (0.18mg/ml)  
 9: *cis*-Vitamin K<sub>1</sub> (0.18mg/ml)  
 10: Vitamin A Palmitate (0.18mg/ml)  
 Inj. Vol: 2.5μl



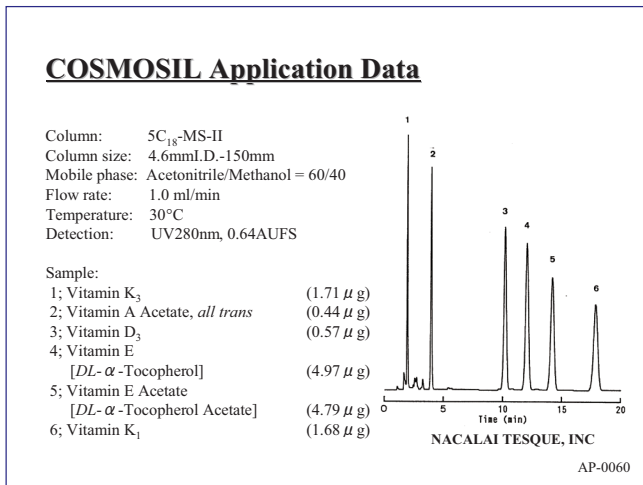
- COSMOSIL Ultra-High Performance columns vs. competitor's sub 2 μm and core-shell columns

#### COSMOSIL Application Data

Mobile phase: A; 0.1% TFA-Methanol/ H<sub>2</sub>O = 90/10  
 B; 0.1% TFA-Methanol  
 B conc. 0%(0-5min)-100%(10min)-100%(15min)  
 Flow rate: 0.4 ml/min  
 Temperature: 40°C  
 Detection: UV280nm  
 Sample:  
 1: Vitamin A Acetate, *all trans* (0.06mg/ml)  
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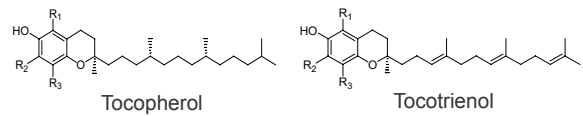


• Fat-soluble vitamins analysis by COSMOSIL C<sub>18</sub>-MS-II column

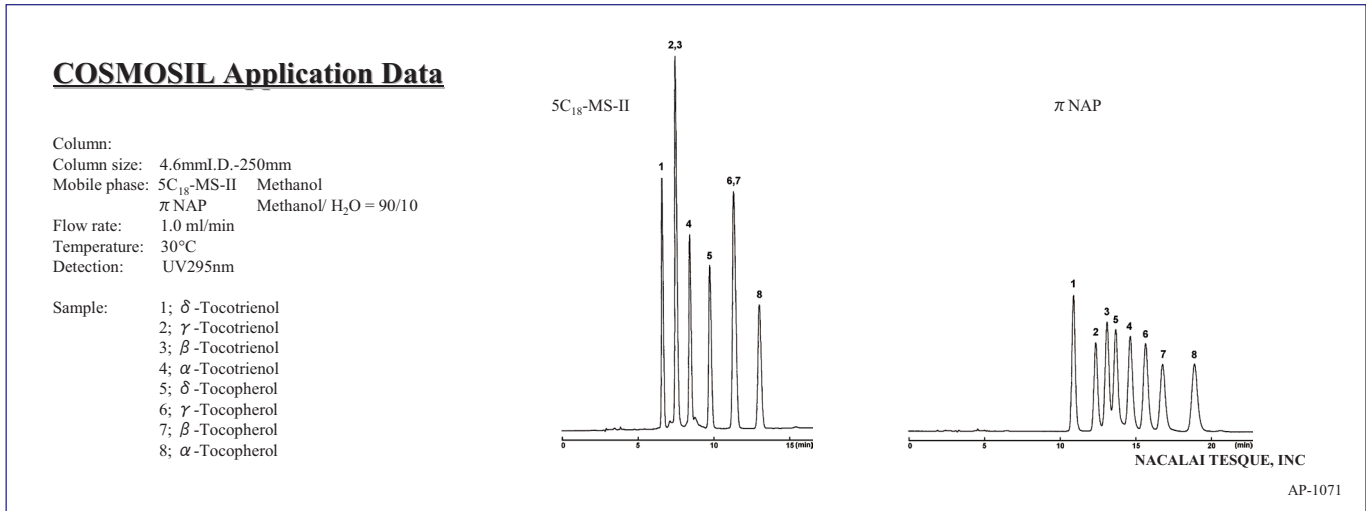


(2) Vitamin E

COSMOSIL πNAP offers complete separation of Vitamin E structural isomers that are difficult to analyze by C<sub>18</sub> columns due to similar hydrophobicity.



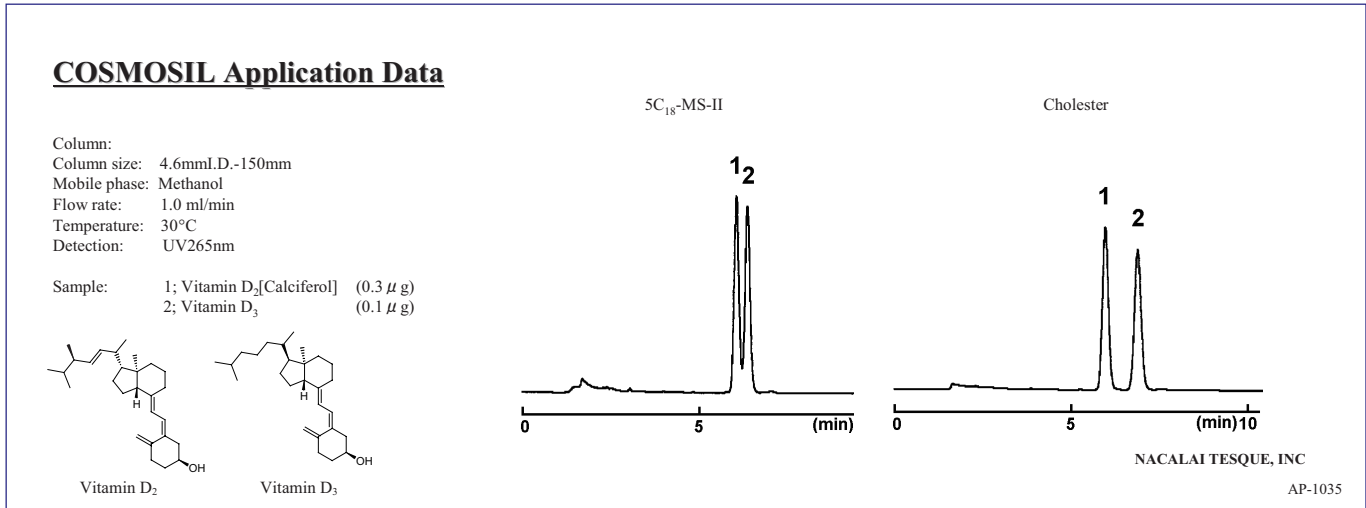
• Tocopherol / Tocotrienol Isomers



(3) Vitamin D

COSMOSIL Cholester offers complete separation of Vitamin D<sub>2</sub> and D<sub>3</sub> that are difficult to analyze by C<sub>18</sub> columns.

• Vitamin D<sub>2</sub> and D<sub>3</sub>

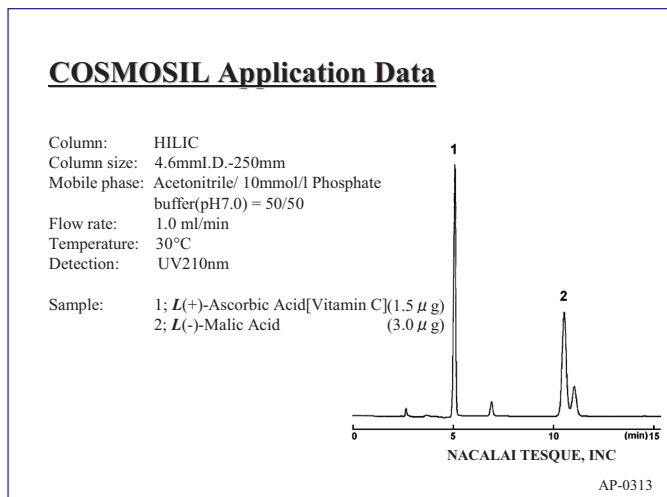




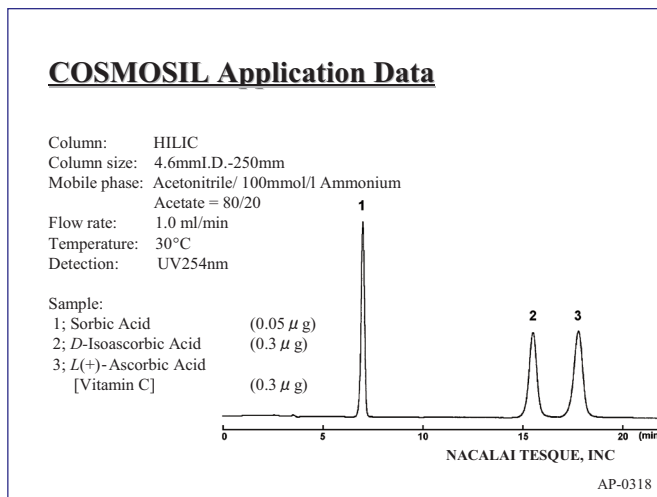
## (2) Vitamin C

COSMOSIL HILIC offers improved separation of Vitamin C derivatives that are difficult to analyze by reverse phase columns.

### • Vitamin C in Fruit Juice

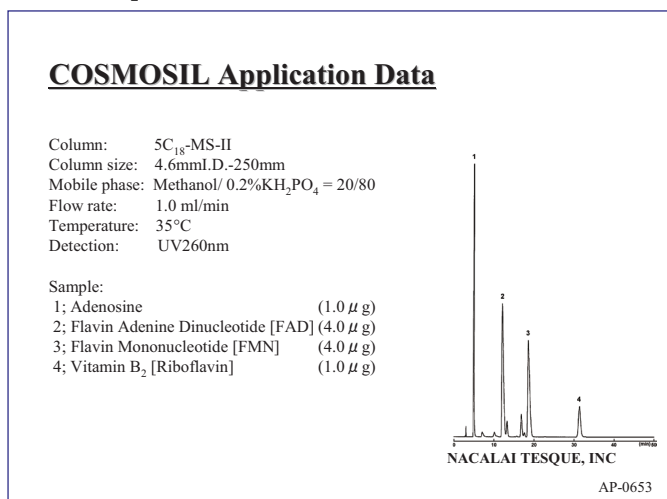


### • Vitamin C

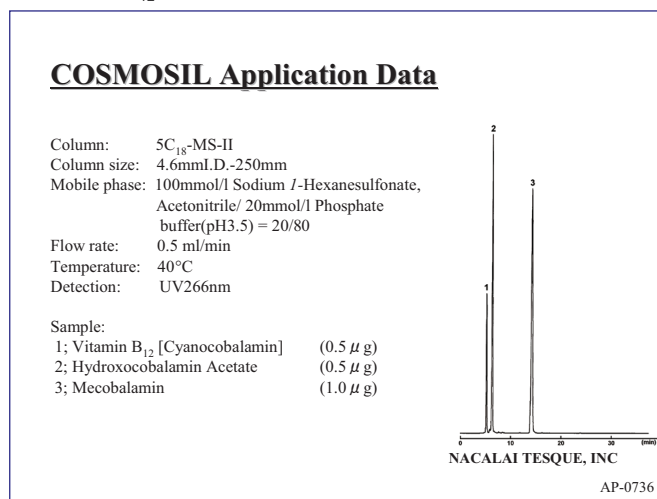


## (3) Vitamin B

### • Vitamin B<sub>2</sub>

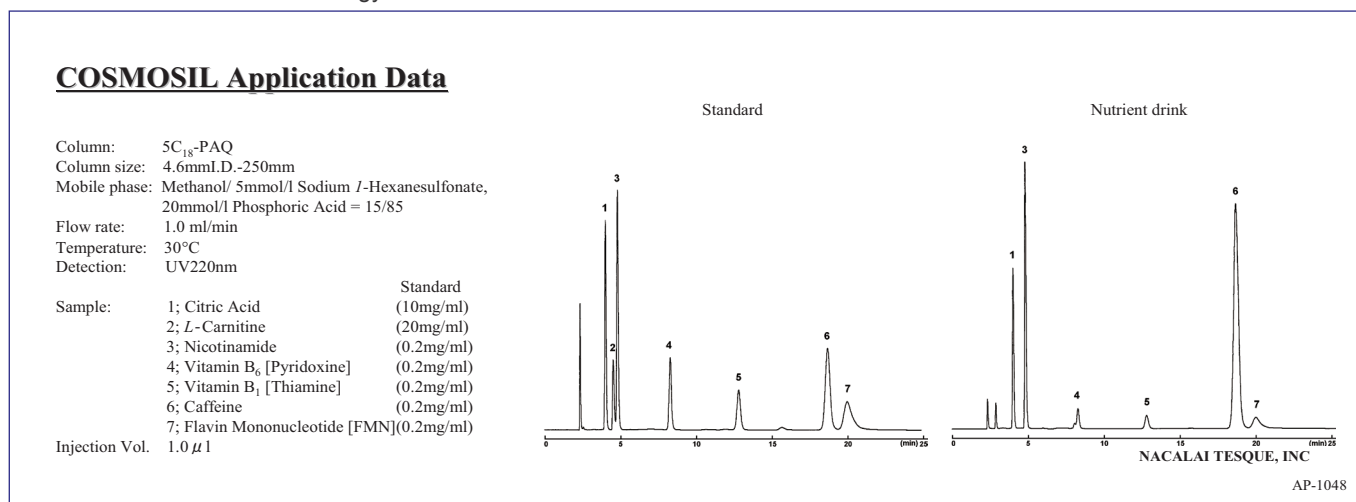


### • Vitamin B<sub>12</sub>



## (4) Vitamins in Food

### • Water-soluble Vitamins in Energy Drinks



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