COSMOSIL

Harmful Food Additive and Contaminant Analysis by HPLC

Technical Note

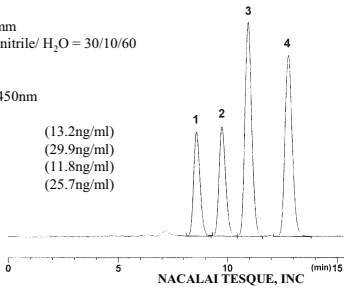
High Performance Liquid Chromatography (HPLC) is a suitable technique for analysis of harmful food additives and contaminants. COSMOSIL ODS and special columns offer improved separation for a large variety of these substances.

(1) Aflatoxins

COSMOSIL Application Data

Column: $5C_{18}$-AR-II
Column size: 4.6mmI.D.-150mm
Mobile phase: Methanol/ Acetonitrile/ H_2O = 30/10/60
Flow rate: 0.8 ml/min
Temperature: 40°C
Detection: Ex.365nm Em.450nm

Sample: 1; Aflatoxin G2 (13.2ng/ml)
2; Aflatoxin G1 (29.9ng/ml)
3; Aflatoxin B2 (11.8ng/ml)
4; Aflatoxin B1 (25.7ng/ml)
Inj.Vol. 20 μl



Data courtesy of a customer

AP-1148

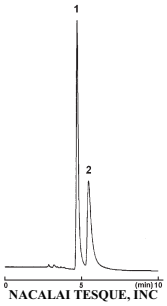
Aflatoxins are naturally occurring mycotoxins. They can colonize and contaminate grains before harvesting or during storage. Aflatoxins are among the most carcinogenic substances known. COSMOSIL $5C_{18}$-AR-II can be used to separate aflatoxins.

(2) 2- and 4-methylimidazole (2-MI and 4-MI)

COSMOSIL Application Data

Column: HILIC
Column size: 4.6mmI.D.-250mm
Mobile phase: Acetonitrile/ 50mmol/l Ammonium Acetate = 90/10
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: UV220nm

Sample: 1; *4*-Methylimidazole (0.25mg/ml)
2; *2*-Methylimidazole (0.25mg/ml)
Inj.Vol.: 1.0μl



AP-1203

2- and 4-methylimidazole (2-MI and 4-MI) are by-products formed during the manufacturing of caramel coloring used in popular soft drinks and foods. These two chemicals are selected by the National Cancer Institute for a long-term study because of the high potential for human exposure. The gas chromatography and reversed-phase HPLC columns with ion-pairing reagent have been traditionally used, but COSMOSIL HILIC offers complete separation of 2- and 4-methylimidazole without ion-pairing reagent.

(3) Melamines

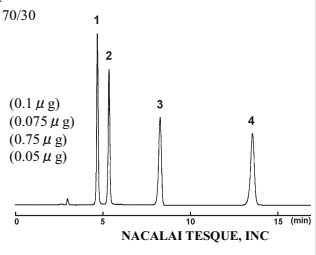
After recent melamine contamination in pet food and dairy products, determination of melamine has become a high priority. COSMOSIL HILIC offers excellent separation of melamine and cyanuric acid. They form a crystalline complex that is more toxic than either one alone.

- **Melamines**

COSMOSIL Application Data

Column: HILIC
Column size: 4.6mmI.D.-250mm
Mobile phase: Acetonitrile/ 10mmol/l Ammonium Acetate = 70/30
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: UV225nm

Sample: 1; Melamine (0.1 μg)
2; Ammeline (0.075 μg)
3; Cyanuric Acid (0.75 μg)
4; Ammelide (0.05 μg)



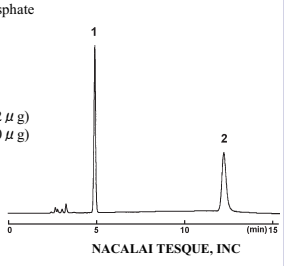
AP-1076

- **Oxalic Acids**

COSMOSIL Application Data

Column: HILIC
Column size: 4.6mmI.D.-250mm
Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7.0) = 50/50
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: UV210nm

Sample: 1; Oxamic Acid (0.2 μg)
2; Oxalic Acid (1.0 μg)



AP-0307

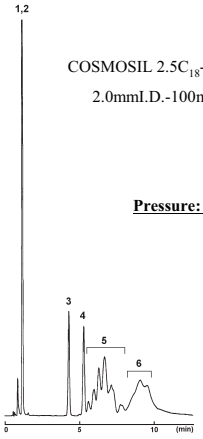
(4) DEHP (Bis(2-ethylhexyl)phthalate)

A few years ago, news reported that DEHP (Bis(2-ethylhexyl)phthalate),a plasticizer, has contaminated the food supply. If taken into the human body in large amounts, DEHP can cause cancer in addition to the risk of liver function damages.
COSMOSIL 2.5C_{18}-MS-II produces an equivalent chromatogram compared with a competitor's 1.7μm column. 2.5C_{18}-MS-II has longer retention time. More importantly, 2.5C_{18}-MS-II operates about 1/3 the pressure of competitor's 1.7 μm column, putting it within the range of conventional HPLC equipment.

COSMOSIL Application Data

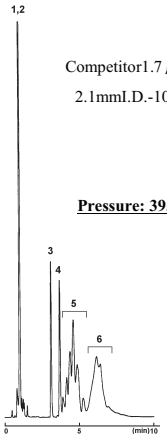
Column:
Column size:
Mobile phase: Methanol/H_2O = 90/10
Flow rate: 0.35 ml/min
Temperature: 40°C
Detection: UV220nm

Sample: 1; DBP (0.05mg/ml)
2; BBP (0.05mg/ml)
3; DEHP (0.05mg/ml)
4; DNOP (0.05mg/ml)
5; DINP (0.25mg/ml)
6; DIDP (0.25mg/ml)
Injection Vol. 5.0 μl



COSMOSIL 2.5C_{18}-MS-II
2.0mmI.D.-100mm

Pressure: 13.2MPa



Competitor1.7 μ mC_{18}
2.1mmI.D.-100mm

Pressure: 39.3MPa

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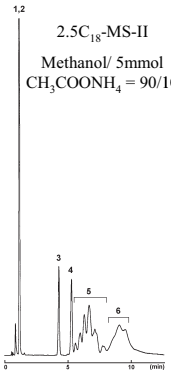
COSMOSIL 2.5πNAP enables separation of DBP(Dibutyl Phthalate)(Sample 1) and BBP (Butyl Benzyl Phtharate)(Sample 2) that are difficult to separate with C_{18} columns.

COSMOSIL Application Data

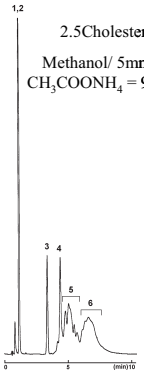
Column:
Column size: 2.0mmI.D.-100mm
Mobile phase:
Flow rate: 0.35 ml/min
Temperature: 40°C
Detection: UV220nm

Sample: 1; DBP (0.05mg/ml)
2; BBP (0.05mg/ml)
3; DEHP (0.05mg/ml)
4; DNOP (0.05mg/ml)
5; DINP (0.25mg/ml)
6; DIDP (0.25mg/ml)
Injection Vol. 5.0 μl

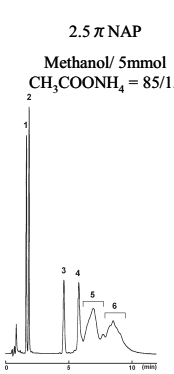
2.5C_{18}-MS-II
Methanol/ 5mmol
CH_3COONH_4 = 90/10



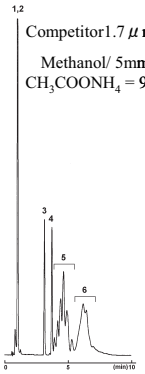
2.5Cholester
Methanol/ 5mmol
CH_3COONH_4 = 90/10



2.5 π NAP
Methanol/ 5mmol
CH_3COONH_4 = 85/15



Competitor1.7 μ mC_{18}
Methanol/ 5mmol
CH_3COONH_4 = 90/10



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The quality for certainty.

NACALAI TESQUE, INC.
Nijo Karasuma, Nakagyo-ku, Kyoto 604-0855 JAPAN
TEL : +81-(0)75-251-1730
FAX : +81-(0)75-251-1763
Website : www.nacalai.com
E-mail : info.intl@nacalai.com