

Dynamic Headspace of Cheese

The most striking characteristics of cheeses are their organoleptic properties. The properties of taste and aroma are dependent upon the milk matrix and the microflora that develop during fermentation. Various volatile compounds in varying amounts help give a cheese its characteristic flavor and taste.

The volatile components of food products like cheese can be analyzed by headspace techniques. The sample material is warmed and the volatiles collected on a trap. They are then thermally desorbed from it and analyzed via GC/MS.

The flavor and aroma of blue cheese is due in part to the presence of methylketones and a dominance of secondary alcohols from C₅ to C₉. Figure 1 shows a sample of Danish Blue Cheese heated to 40°C and purged with helium at 100 ml/min for 20 minutes. Figure 2 shows a sample of cheddar cheese exposed to the same conditions and showing the butyric acid that may make a contribution to the flavor of this variety of cheese. The presence of benzoic acid is the result of microbial activity during the manufacturing process.

The analytical technique of dynamic headspace for the analysis of cheese is a very viable one. It is suitable for both quantitative and qualitative marker compound analysis. It may also have the potential as a technique for monitoring the manufacturing process of the cheese itself.

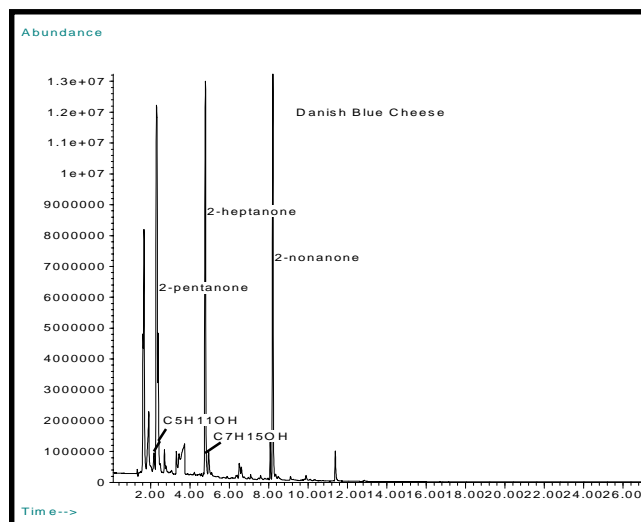


Figure 1. Danish Blue Cheese

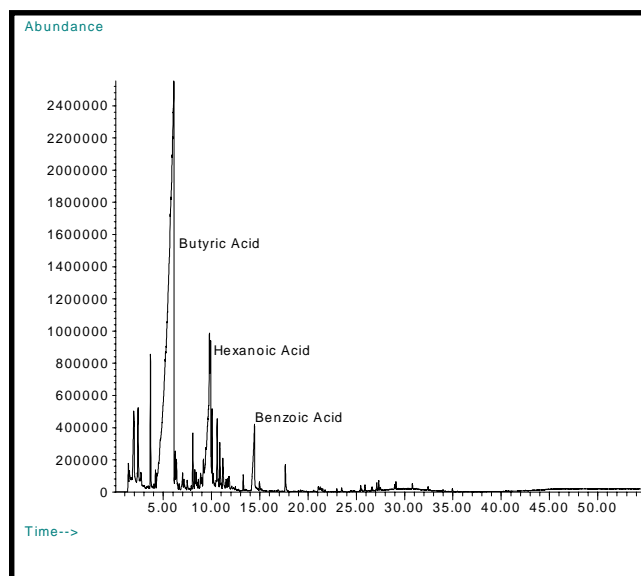


Figure 2. Cheddar Cheese

Equipment

These samples were analyzed using a CDS Model 8000 Universal Sample Concentrator, interfaced to an Agilent 6890 gas chromatograph which was equipped with a 5973 MSD as the detector.

Model 8000 Conditions

Valve Oven: 225°C
Transfer Line: 250°C
Temperature: 50°
Time: 20 minutes
Trap: Tenax
Trap Desorb: 225°C for 5 minutes

GC Conditions

Carrier: Helium
Column: HP-5 (30m X 0.23)
Detector: MSD
GC Program:
Initial: 50°C for 2 minutes
Ramp: 10°C/min.
Final: 250°C

FOR MORE INFORMATION
CONCERNING THIS APPLICATION,
WE RECOMMEND THE
FOLLOWING READING:

T. P. Wampler, Analysis of Food Volatiles Using Headspace-GC Techniques, in R. Marsili (Ed.) *Flavor, Fragrance, and Odor Analysis*, Marcel Dekker, New York, 2002

Additional literature on this and related applications may be obtained by contacting your local CDS Analytical representative, or directly from CDS at the address below.



CDS Analytical, Inc. has been a leader in the design and manufacture of laboratory instruments for sample preparation and analysis since 1969. We are dedicated to providing the best possible instruments for both research and routine analysis. Well known in the field of pyrolysis, CDS manufactures the Pyroprobe® 1000, 2000 and 2500 autosampler for the introduction and analysis of solid materials by GC, MS and FT-IR. CDS offers a complete line of dynamic headspace instruments for the analysis of volatile organic compounds in environmental, pharmaceutical and food applications, including the model 6500 16 position autosampler for complex, multicomponent materials investigation. Our customers, their requirements and applications are important to us. To help meet your needs, we offer a wide range of analytical information and the services of our applications laboratory. If you would like additional information, please contact us at the address below, call us at 1 800 541 6593, or log onto www.cdsanalytical.com.