

Detection of Vanilla Flavor Compounds In Foods

Vanilla flavor comes from vanilla beans and is commonly used to enhance sweet tasting foods. The main component is vanillin (2-hydroxy-3-methoxy-benzaldehyde). Since vanillin is relatively volatile, it may be collected by dynamic headspace from a variety of foods, using the CDS Model 8000 Sample Concentrator.

With dynamic headspace, no sample preparation is needed. In the case of the natural vanilla bean, the dried vanilla bean was simply placed into a test tube desorber vessel. Larger objects, such as the cookies, vanilla wafers, were also sampled intact, using the "bulk" (800mL) headspace sampler. These vessels are easily interchangeable on the Model 8000 Sample Concentrator.

The vessel containing the bean was purged with helium for 20 minutes at an elevated temperature to the sorbent trap. After the sampling time, the trap was automatically placed on-line with the gas chromatograph and thermally desorbed to transfer the compounds to the GC for analysis.

Figure 1 shows a chromatogram of the collected organics from the vanilla bean. Vanillin, the main component of interest, eluted at 20 minutes. Imitation vanilla extract was sampled in the same way with the test tube desorber, and cookies with the bulk headspace sampler. Vanillin was found easily when its base peak, 152, was extracted from the chromatograms. (Figures 2 and 3). When sampled in the same way, vanillin was also detected in vanilla cola. These same techniques have been used to identify other flavor compounds in a variety of foods.

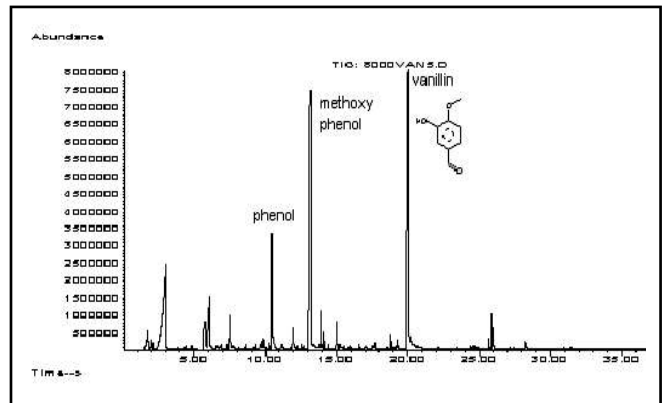


Figure 1. Dynamic headspace of a vanilla bean.

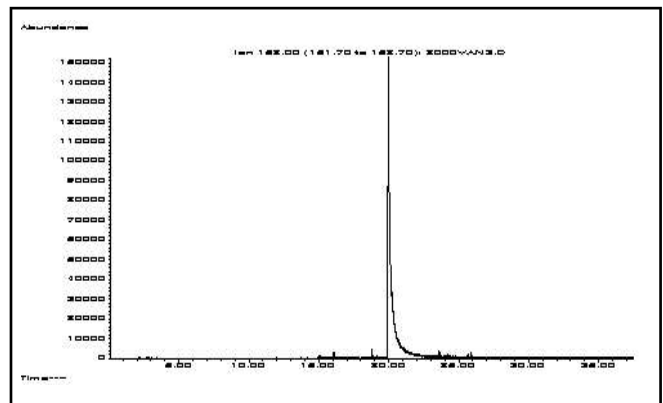


Figure 2. Extracted ion 152 (vanillin) of imitation vanilla extract.

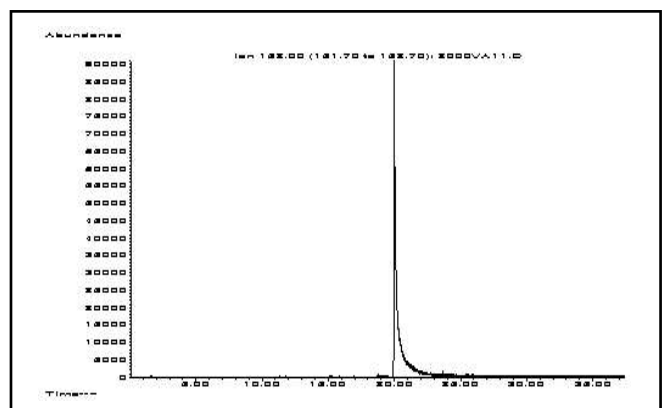


Figure 3. Extracted ion 152 of vanilla wafers.

Equipment

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

Model 8000 Conditions

Valve Oven: 250°C
Transfer Line: 250°C
Vessel: 800mL or test tube
Temperature: 100°
Time: 20 minutes
Trap: Tenax
Trap Desorb: 300°C for 5 minutes

GC Conditions

Carrier: Helium
Split: 25:1
Column: RTX-35 (30mX 0.25mmX0.25µm)
Detector: MSD

GC Program:

Initial: 40°C for 2 minutes
Ramp: 8°C/min.
Final: 300°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.) *Techniques for Analyzing Food Aroma*, Marcel Dekker, New York, 1997.

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.



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