Analysis of Chocolate Products by Dynamic Headspace

Application Note
Food & Flavor

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Thermal Desorption/Dynamic Headspace can be used to effectively characterize many food raw materials as well as finished products. The volatile components are purged from the sample chamber and collected onto a trap for transfer to the GC for analysis. Quantitation of profile components can also be done. This application note will focus on the analysis of milk chocolate (raw material) and a finished chocolate product (peppermint pattie).

Samples of ground milk chocolate and peppermint pattie (~500mg) were placed into separate dynamic headspace vessels, and desorbed. The chocolate sample was desorbed at 60°C and 90°C. The pepperment pattie was desorbed at 40°C.

Figure 1 shows the total ion chromatogram profile of milk chocolate desorbed at 60°C. Note the elution of Acetic(1), Butanoic (2), Hexanoic (3), and Benzoic acids (4) respectively. Figure 2 shows the same sample heated to 90°C for 10 minutes. Acid elution continues, but note the Vanillin peak (5) at approximately 14 minutes. Figure 3 shows the chromatogram of the ground peppermint pattie. Compound elutions include Acetic Acid (1), Eucalyptol (2) Menthone (3), t-Menthone (4), Menthol (5), and Menthyl Acetate (6).

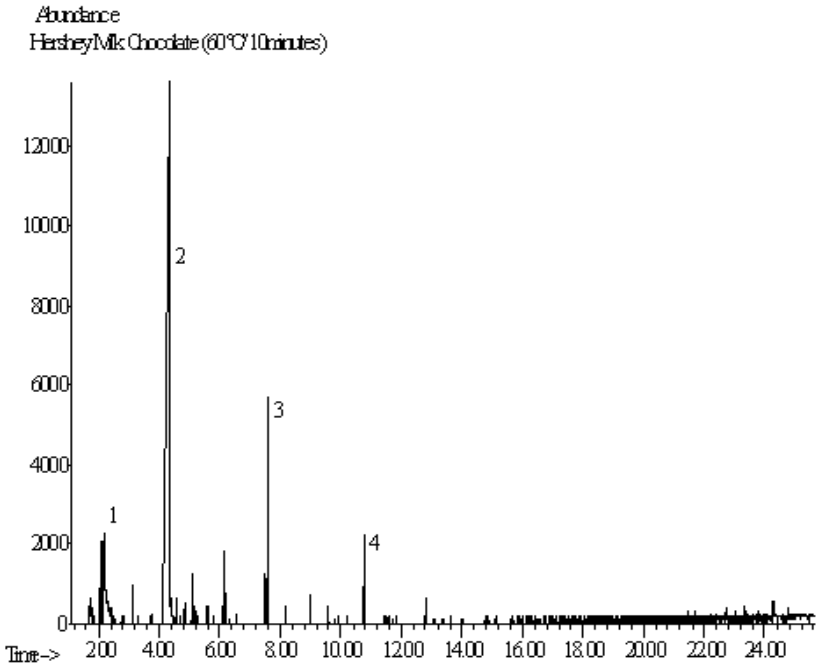

Figure 1. Milk chocolate desorbed at 60°C.

Instrument Conditions

CDS Sample Concentrator

Valve Oven:	275°C	
Transfer Line:	250°C	
Tube Heat:	40°C, 60°C, 90°C	10 minutes
Trap Heat:	275°C	5.00 minutes

GC/MS

Column:	30m x 0.25 mm 5% phenyl
Carrier:	Helium, 50:1 split
Injector:	350°C
Program:	40°C for 2 minutes, 10°/min to 295°C (2 min)

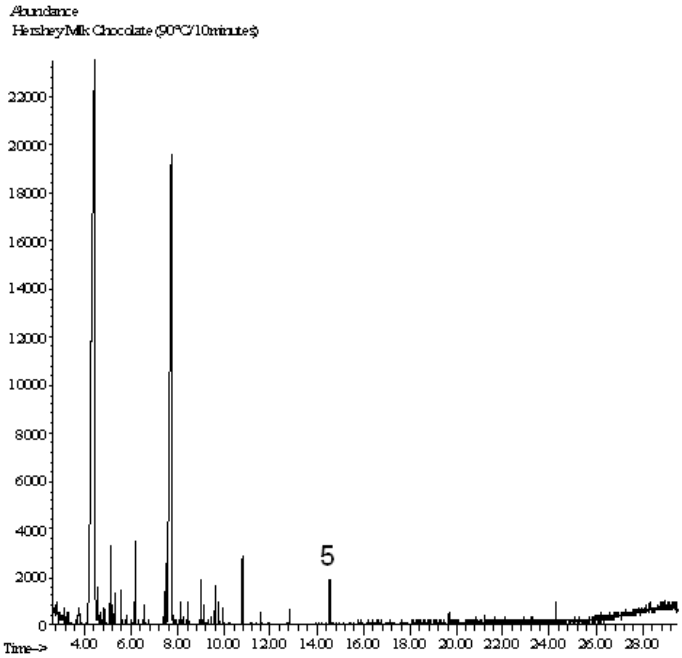

Figure 2. Milk chocolate desorbed at 90°C.

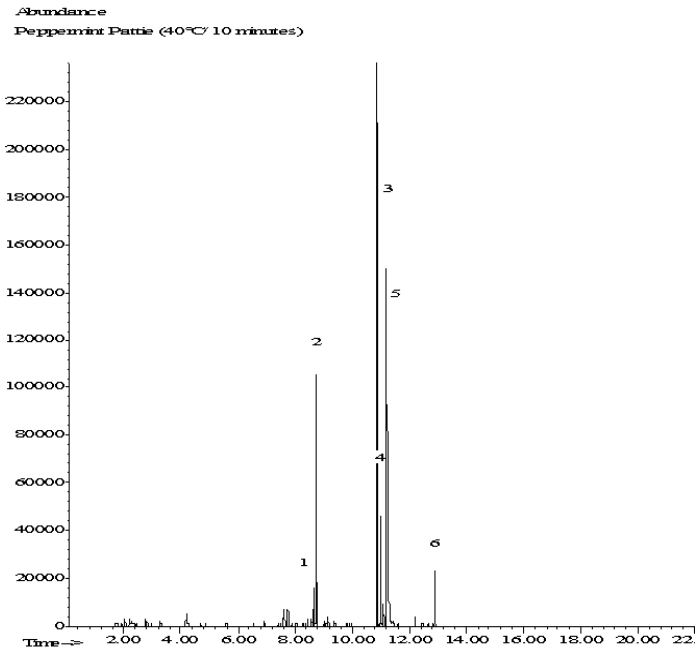

Figure 3. Peppermint patty desorbed at 40°C.