

## COFFEE VOLATILE PROFILES

### Using dynamic headspace and the Dynatherm TDA

Organoleptic (perceived by a sense organ) properties of food products effect our perception of taste and smell, as well as how palatable a product will be to the consumer. It is apparent that these properties in many food and food products depend upon volatile organic compounds present in the product and evolved during preparation.

Dynamic headspace is a technique in which volatiles are purged from a sample, usually using helium or nitrogen as a carrier. The volatiles are purged either at ambient temperature or sometimes elevated temperatures. The volatiles are collected onto a trap which typically consists of polymeric material like Tenax or a multibed trap consisting of specially treated carbons. The samples are then thermally desorbed onto a focusing trap which in turn is thermally desorbed on to a GC or GC/MS.

Two samples of coffee, consisting of a ground and a perked liquid sample, were individually placed into an 800 ml dynamic headspace vessel. The vessel was sealed and a flow of helium was started. An exterior helium vent port containing a Tenax sampling tube collected volatiles from the ground coffee sample (25 ml volume) and the perked sample (25 ml). Each sample was purged for 30 minutes. The collection tubes were then thermally desorbed using the TDA interfaced to an ACEM 9300 and a GC/MS. Clearly, the profiles of dry ground coffee compared to the volatiles of a "perked" sample are different. The large number of aldehyde compounds in the perked sample may be the enticer that stimulates the senses and makes one have to have another cup of "Java".

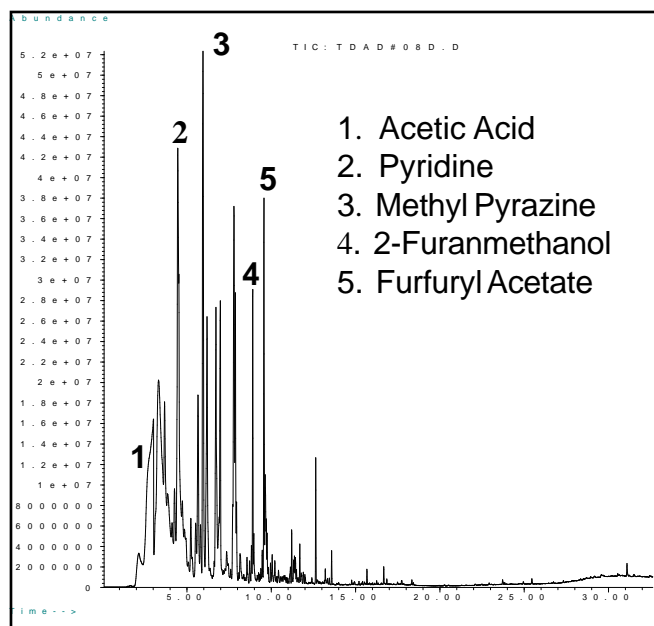


Figure 1 Volatiles of Ground Coffee

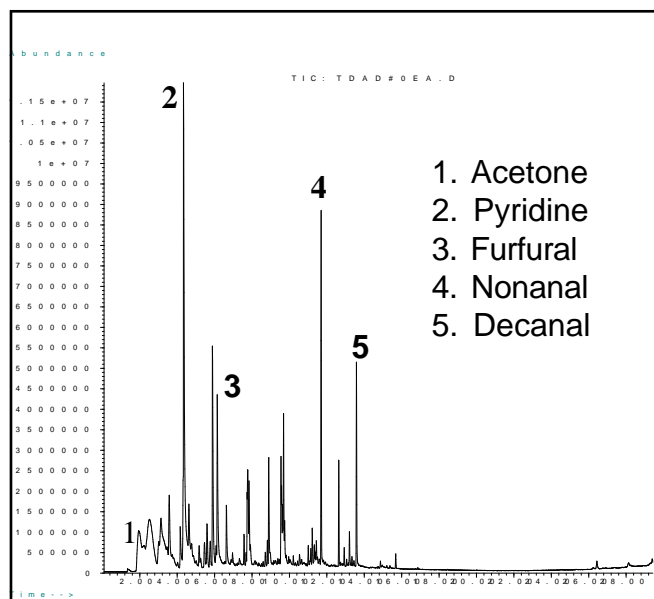


Figure 2 Volatiles of "Perked" Coffee

## Equipment

These samples were analyzed using the CDS 800 ml Dynamic Headspace Vessel (modified). The coffee volatiles were thermally desorbed using the TDA, interfaced to an ACEM 9300. This instrument in turn was interfaced to an Agilent 6850 Network GC/MS System.

### CDS 800ml DHS Vessel Conditions

Purge Flow (He): 50ml/min

### TDA/ACEM 9300 Conditions

Valve Oven:	300°C
Transfer Line:	260°C
Dry Tube:	100°C/5min
Tube Heat:	275°C/7min
Trap Heat	300°C/7min
Aux 1	350°C

### GC Conditions:

Carrier:	Helium
Column:	HP-5MS (30m x 0.25mm x 0.25µm)
Detector:	MSD
GC Program:	
Initial:	40°C/2min
Ramp:	15°C/min
Final:	300°C



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® 5000, 5150, 5200 and 5250 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 8400 four-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](http://www.cdsanalytical.com).