

CDSolutions

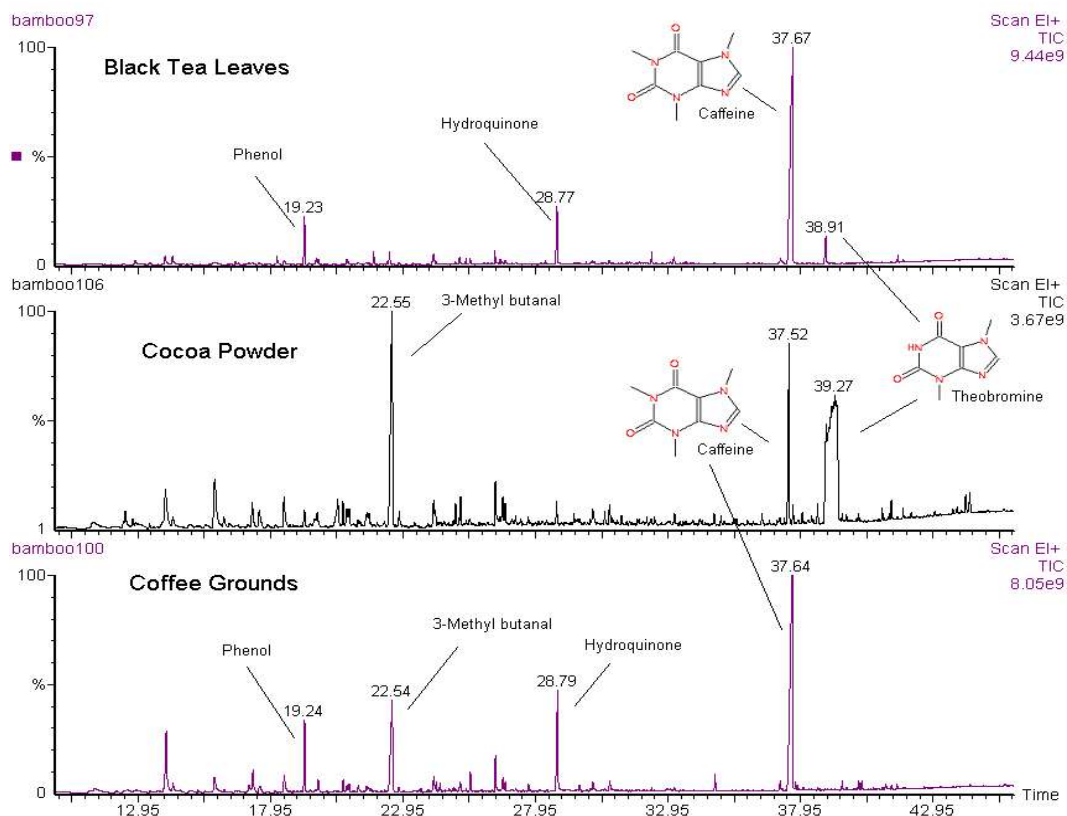
APPLICATIONS INFORMATION USING ADVANCED SAMPLE HANDLING TECHNOLOGY

Thermal Extraction of Coffee, Tea, and Cocoa using the 5200 Pyroprobe

Although the CDS Model 5200 Pyroprobe is used mainly for analytical pyrolysis, it also can be used for thermal sampling at sub-pyrolysis temperatures for semi-volatiles. To compare the thermally labile compounds present in coffee, tea, and cocoa, we placed about 50 micrograms of each into a quartz sample tubes for analysis. The tube was inserted into the Pyroprobe coil of the 5200, and both the coil and interface were heated to 300°C for 3 minutes. The resulting volatiles were swept to the GC/MS via a heated transfer line.

Coffee grounds, cocoa powder and black tea leaves all shared compounds. Like compounds include caffeine, phenol, and hydroquinone, but the relative amounts of these components differ. Cocoa has much more 3-methyl butanal than either coffee or tea. Present in large amounts in cocoa, lesser amounts in tea leaves, but notably absent in coffee grounds is theobromine, a stimulant that provides alertness.

The 5200 is a versatile thermal sampling instrument, enabling the analyst to extract and analyze compounds thermally in one step. Caffeine and theobromine were detected in coffee grounds, cocoa powder, and tea leaves without the use of hazardous chemicals, and without the time required for solvent extraction.



Equipment

These samples were analyzed using a CDS Model 5200 Pyroprobe in direct (no trapping) mode, interfaced to a Perkin Elmer Clarus Turbomass gas chromatograph/mass spectrometer.

Model 5200 Conditions

Valve Oven: 300°C
Transfer Line: 300°C
Coil: 300°C for 3 minutes
Interface: 300°C for 3 minutes

GC Conditions

Carrier: Helium
Injector: 300°C
Split: 50:1
Column: HP-5MS (30m X 0.25mm)
Detector: Quadrupole
Range: 35 - 550

GC Program:

Initial: 40°C for 2 minutes
Ramp: 10°C/min.
Final: 300°C

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® 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. CDS also manufactures the Dynatherm line of thermal desorption instruments including the 9000 series for air monitoring and the 9300 TDA. 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).