CDS olutions

APPLICATIONS INFORMATION USING ADVANCED SAMPLE HANDLING TECHNOLOGY

Biochemical Analysis by Py-GC/MS

Biosystem components, such as DNA, do not normally lend themselves to thermal analysis. Matrix complexity as well as lack of volatility would seemingly rule out pyrolysis-GC/MS as the method of choice. However, work has been done that clearly shows thermal analysis can be applied successfully to a biosystem component like DNA.

Pyrolysis is a technique that thermally fragments compounds and liberates volatile organic materials from a matrix that is relatively non-volatile. Sample analysis amounts are <100 mcg. The volatiles are then separated by gas chromatography and identified by use of a mass selective detector in conjunction with a database library like Wiley or Nist.

Figure 1 shows the total ion chromatogram of the sugar deoxyribose which is present in the deoxyribonucleic acid. A well resolved biomarker compound for this appears to be the heterocyclic alcohol, 2-Furanmethanol, occurring at about 7.2 minutes. A sample of DNA was likewise thermally treated and the various ion chromatogram peaks were examined. Figure 2 shows a prominent peak of 2-Furanmethanol.

Clearly, pyrolysis as applied to selected biosystem components is a novel way of using thermal analysis. It can be used to obtain both quantitative as well as qualitative data.

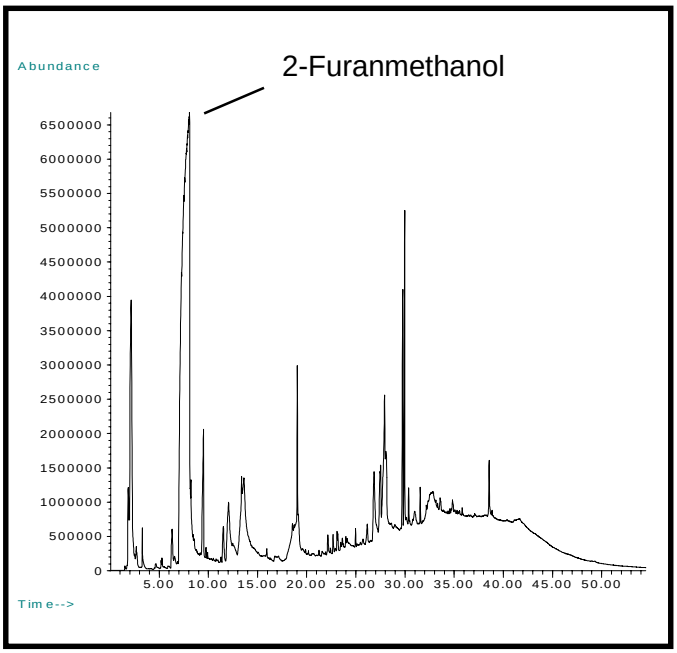

Figure 1. Deoxyribose

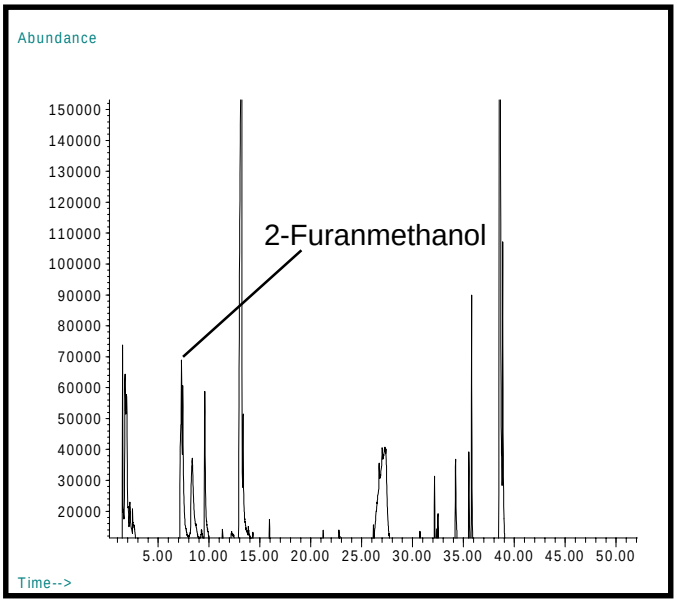

Figure 2. DNA

Equipment

All samples were pyrolysed using a CDS 2500 Autosampler interfaced to a Hewlett-Packard 6890 gas chromatograph with a Hewlett Packard 5972A mass selective detector.

CDS 2500 Conditions

Interface Temperature:	300°C
Temperature:	400°C
Time:	15 seconds

Chromatography:

Carrier:	He
Column:	HP5M
Split:	10:1
Initial Temperature:	40°C/2 minutes
Ramp:	6°C/minute
Final Temperature:	295°C/10 minutes

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

Larry Eudy et al., *Gas Chromatography-Mass Spectrometry Studies On The Occurrence Of Acetamide, Propionamide, and Furfuryl Alcohol in Pyrolyzates of Bacteria, Bacterial Fractions and Model Compounds,* Journal of Analytical and Applied Pyrolysis, 7 (1985) 231-247.

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.

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.**

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