CDS olutions

APPLICATIONS INFORMATION USING ADVANCED SAMPLE HANDLING TECHNOLOGY

Analysis of Cosmetics by Pyrolysis-GC/MS

Cosmetics include a diverse group of products such as lipsticks, mascara, eyeshadow, moisturizers, foundations, and many other specialty products. Their formulations are extremely complex, consisting of a myriad of components. The list of ingredients runs the gamut from alcohol as a solvent to methyl paraben used as a broad spectrum antimicrobial. Many formulations contain both organic and inorganic pigments.

Traditional component analyses require large sample amounts as well as tedious solvent extractions. Pyrolysis-GC/MS is a viable alternative to these methods. Pyrolysis is defined as the use of thermal energy only to effect chemical degradation. The CDS 2500 Autosampler interfaced to a GC/MS enables small samples to be pyrolysed and analysed efficiently with minimal preparation.

Figure 1 shows a chromatogram of a typical nail polish containing the monomers methyl methacrylate (MMA) and butyl methacrylate. The peak at about thirty three minutes is dibutyl phthalate, a plasticiser (DBP) and is used to give the nail polish polymers flexibility and to help prevent chipping.

Figure 2 is a chromatogram of a liquid eye liner. Note the pyrrolidinone peak which is the carrier liquid in the eye liner. The high molecular weight aliphatic hydocarbons are used to make the liner less impervious to water.

These two chromatograms of cosmetic products clearly illustrate the analytical power of thermally treating samples. The versatility of thermal sample preparation easily lends itself to deformulation work in R&D, as well quality assurance for production.

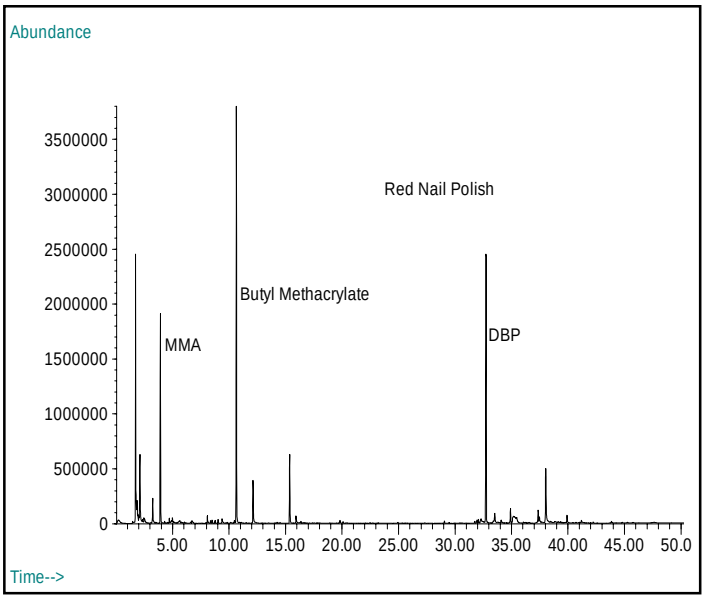

Figure 1. Nail Polish

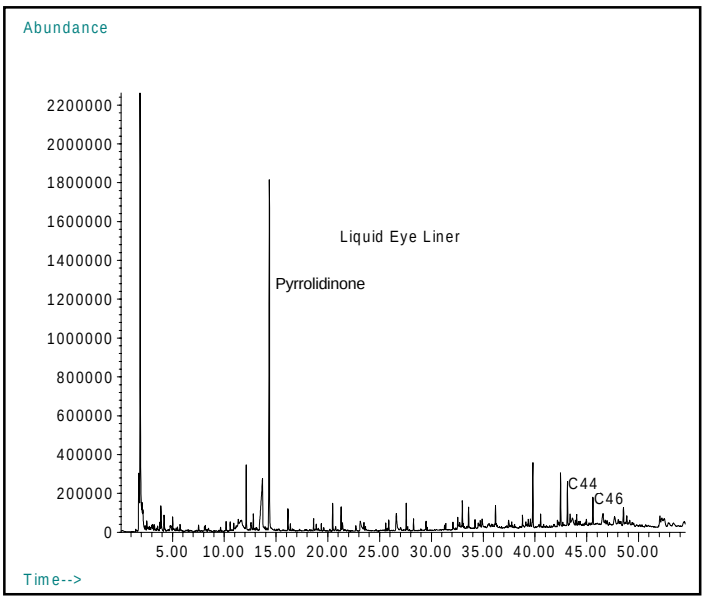

Figure 2. Liqiud Eye Liner

Equipment

All samples were pyrolysed using the CDS Model 2500 Pyroprobe Autosampler interfaced to an HP6890 gas chromatograph with an HP5972A mass selective detector.

Model AS 2500 Conditions

Interface Temperature:	300°C
Pyrolysis Temperature:	700°C
Time:	15 s
Sample Amount:	25-50 micrograms

Gas Chromatograph Conditions

Gas Chromatograph:	HP6890
Column:	HP-5M
	30 m x 0.25 mm
Carrier Gas;	He
Split Ratio:	75:1
Initial:	40°C for 2 min
Ramp:	6°C/min
Final:	295°C for 10 min hold
Detector:	HP5972A MSD

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

P. Bore, Cosmetic Analysis, Marcel Dekker, New York, 1985

A. Senzel, Newburgers Manual of Cosmetic Analysis, AOAC International, Maryland, 1977

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.**

CDS Analytical, Inc. 465 Limestone Road, P.O. Box 277, Oxford, PA USA 19363-0277 PH: 610 932 3636 FX: 610 932 4158