PerkinElmer precisely.

GC Know-How Now

A quarterly e-newsletter only from PerkinElmer

Spring 2006

Clarus 500 Gas Chromatograph

Change the way you look at gas chromatography

Clarus 500 GC Mass Spectometer

Ultimate data integrity

TurboMatrix Headspace Trap Samplers

The clear choice for any GC or GC/MS volatile-analysis system

TurboMatrix 650 ATD Thermal Desorber

Unrivaled performance through innovation

PerkinElmer-Arnel GC Systems

Proven turnkey and customized industrial solutions

Announcements

NEW TurboMass™ 5.2 GC/MS Software

NEW TurboMatrix 650 ATD Thermal Desorber

NEW Ozone Precursor Analyzers

What's new in GC Consumables

Welcome to the first edition of GC Know-How Now!

This quarterly e-newsletter from PerkinElmer was created to help you get the most from your gas chromatography system. Here you will find articles about GC applications plus links to PerkinElmer's GC training sessions and other events, announcements and current promotions. We hope you will find it a useful tool.

Automated Sample Re-collection for Thermal Desorption Sampling

Validation studies demonstrate no mass discrimination effects during multiple sample re-collection using the TurboMatrix 650 ATD Thermal Desorber. There was no evidence of non-linear splitting of sample vapor during trap desorption.

Authors: Andrew Tipler, David Scott and Mark Collins
PerkinElmer Life and Analytical Sciences

Introduction

The TurboMatrix™ 650 ATD thermal desorber incorporates technology allowing a portion of desorbed sample vapor, which would otherwise be lost through sample splitting and venting, to automatically be re-collected onto the original or a fresh sorbent tube for subsequent analysis.

A gasoline vapor sample was used to determine if a mass discrimination effect would occur as a result of nonlinear splitting of the sample vapor during trap desorption. Several peaks were chosen throughout the chromatography of the sample to demonstrate consistency of peak-area ratios in a sequence of replicate analyses from a single sorbent tube.

Experimental Conditions

The thermal desorber-gas chromatography system (PerkinElmer TurboMatrix 650 ATD and Clarus® 500 GC) was set up with the following experimental conditions:

Thermal desorber – Valve temperature: 250 °C; Tube oven temperature: 280 °C; Transfer line: 250 °C; Purge time: 1 min; Carrier pressure: 12 psig; Trap low: -10 °C; Trap high: 350 °C; Primary desorb: 5 min; Secondary desorb: 3 min; Desorb flow: 20 mL/min; Recollect flow: 50 mL/min.

GC oven – 35 °C (hold for 5 min) then 5 °C/min to 150 °C (hold for 5 min).

Detector – Flame ionization: 250 °C; Range: 1; Attenuation: 4.

NEW Unconditioned Thermal Desorber Tubes

Promotions

Upcoming North America Trade Shows

Gulf Analytical Summit
May 2–3, 2006,
Galveston, TX

MidAtlantic Association of Forensic Scientists (MAAFS)
May 3–5, 2006,
Richmond, VA

Lubrication Excellence
May 16–18, 2006,
Columbus, OH

American Society for Mass Spectrometry (ASMS)
May 28–June 1, 2006,
Seattle, WA

American Society of Brewing Chemists (ASBC)
June 17–21,
La Quinta, CA

Upcoming GC Training Sessions

Fundamental Gas Chromatography
- *May 16–17, San Jose, CA*
- *June 20–21, Atlanta, GA*

Columns and Troubleshooting
- *May 18–19, San Jose, CA*
- *June 22–24, Atlanta, GA*

TurboMass/ TurboMass Gold GC/MS Operation
- *May 2–5, Chicago, IL*
- *June 23–26, San Jose, CA*
- *June 6–9, Shelton, CT*

For a full schedule click here.

Additional Application Information

GC applications

Results

Data were obtained from 19 replicate analyses of a tube loaded with gasoline. The peak areas of Peaks 1 through 4 and Peaks 6 through 11 were ratioed against the peak area for Peak 5 for the chromatogram obtained for each analysis.

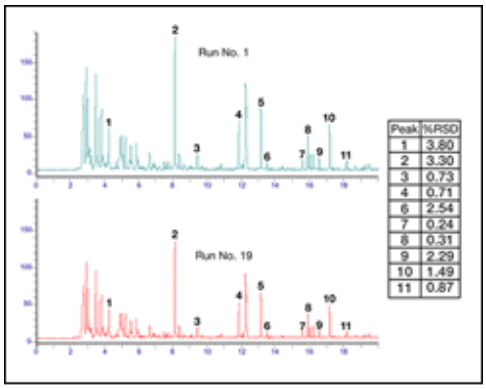

Figure 1. Chromatograms from 19 replicate analytes and the precision in the areas of selected peaks normalized to those of Peak 5.

Figure 1 shows the first and the last run chromatograms. The percent relative standard deviation (%RSD) for each peak is shown.

Peaks 1, 2, 6, 9, and 10 were not fully baseline-resolved. This may have contributed to a slightly higher %RSD than for the other peaks.

Figure 1 shows, however, that the relative responses of all the peaks are consistent throughout the sequence of analyses (from first to last run). If there was a mass discrimination effect, then a progressive increase in the relative standard deviations would have been observed.

Conclusions

The data obtained from 19 replicate analyses of a tube loaded with gasoline vapor are impressive because a large number of repeat runs were conducted without any obvious degradation in the chromatography.

Data show that the TurboMatrix 650 ATD technology and the method used for sample re-collection do not exhibit mass discrimination. The high precision achieved enhances confidence in the results.

The automated sample re-collection technique provides the ability to reliably conduct a second (or multiple) reanalysis of a sample. Additionally, this technique also allows a sample to be run under more than one condition so that more information can be obtained. For example, it is possible to determine both high and low concentration analytes within the same sample. Run the sample at a high split ratio and follow it with a reanalysis at a lower ratio. This greatly expands the dynamic range of the analysis without additional sample preparation.

Download the complete technical note.

GC/MS applications

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