RESPONSE AND RETENTION TIME EQUIVALENCY TO AGILENT 7890B GC

Technology Advantage: Agilent Intuvo 9000 GC with Agilent 5977 MSD

Introduction

The Agilent 7890B GC is the gold-standard instrument for the analysis of semivolatile organic compounds (SVOCs) in high-throughput contract environmental laboratories throughout the world. The performance of the 7890B GC has set the standard for the analysis of SVOCs.

The Agilent Intuvo 9000 GC delivers the same high-quality performance as a 7890B GC while providing advantages only attainable with the Intuvo 9000 GC including:

- Fast cooldown to improve throughput
- Easy column maintenance with clip-free columns
- Protection of the column from matrix fouling with the Guard Chip

This Application Brief demonstrates the equivalency in retention time and analyte response to the 7890B GC using the same instrumental conditions without the need for method translation.

Instrument Methods

To demonstrate equivalency, the same instrument configuration and parameters were used between the 7890B and the Intuvo 9000.

Sample

A mixture of 77 acids, bases, and neutrals at 20 µg/mL, and six internal standards at 40 µg/mL in dichloromethane was used.

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Common 7890B and Intuvo 9000 GC/MS parameters

Parameter	Value
Inlet	Split/splitless 300 °C
Injection volume	1 µL
Pulsed splitless injection	60 psi to 0.5 minutes Purge 50 mL/min at 0.5 minutes
Septum purge	Switched flow mode 3 mL/min
Column	Agilent DB-5ms UI 30 m × 0.25 mm, 0.5 µm
Constant column flow	2 mL/min
Column temperature	40 °C for 2 minutes 20 °C/min to 260 °C 6 °C/min to 330 °C, hold 1.3 minutes
Agilent 5977 MSD with inert ion source	
Transfer line	330 °C
Source	330 °C
MS Quad	330 °C

Results and Discussion

Figure 1 shows the normalized total ion chromatogram (TIC) for an injection of the SVOC standard on the 7890B GC and on the Intuvo 9000 GC.

The chromatograms are virtually indistinguishable. The average difference in relative retention time of the 77 target compounds is 0.0006 minutes, and the average difference in response factors is 4.6 %.

If closely inspected, slight differences can be observed for the clusters of peaks eluting at retention times around 12.5 and 16.5 minutes. These are attributed to small differences in resolution as a result of normal variation in column performance, not gas chromatograph performance.

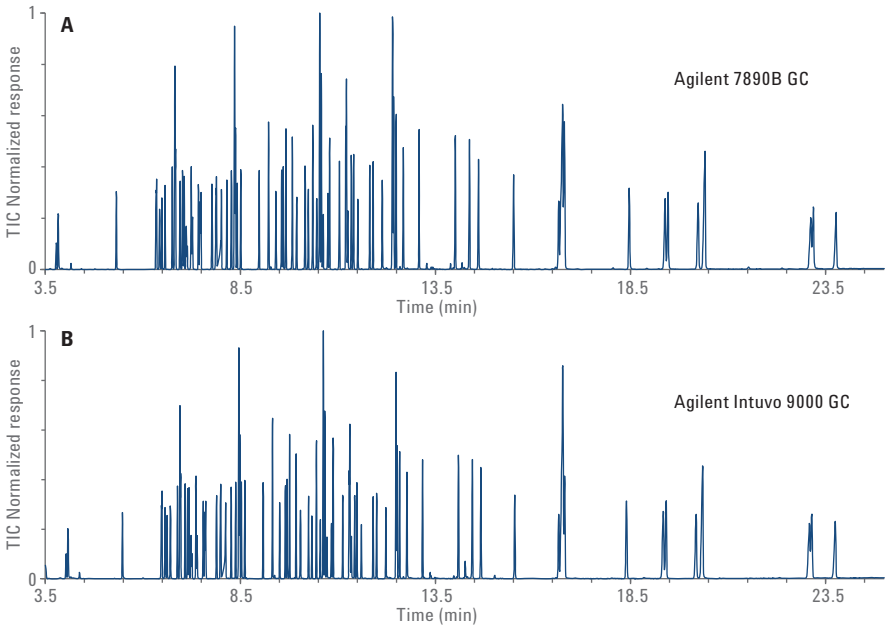

Figure 1. Normalized TIC for the SVOC standard using an Agilent 7890B GC (A) and an Agilent Intuvo 9000 GC (B).

Conclusion

The Agilent Intuvo 9000 GC provides equivalent retention time and analyte response using the same instrumental conditions and method parameters as the Agilent 7890B GC without the need for method translation. For more information on the analysis of SVOCs using the Intuvo 9000 GC, refer to the Application Note[1].

Reference

1. Giardina, M. Analysis of Semivolatile Organic Compounds using the Intuvo 9000 GC, Agilent Technologies Application Note, publication number 5991-7180EN, **2016**.

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