

Measurement of Multiple Points Using Automatic Switching on the smartGC-infiTOF

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Overview

- Using our “smartGC-infiTOF,” CH₄ in air samples was analyzed from seven sampling lines without any variation in sensitivity.
- Our “smartGC-infiTOF” is effective for trace impurity analysis applications that require automatic switching of several different sampling lines.

Introduction

For trace impurity analysis of gas samples, we typically use GC and GC-MS. For some applications, high throughput, automatic measurement of several sampling lines by a single instrument is desirable.

In this application note, we present a method for measuring CH₄ (approximately 1.8 ppm) in air samples from seven sampling lines with automatic switching using our “smartGC-infiTOF” GC-MS system.

Experimental

Our smartGC system is equipped with eight gas-sampling lines. Ports one through seven can be connected to any desired gas sample and can be measured in any order. The remaining port is used for a concentration calibration. In this experiment, we measured CH₄ in air from each port starting from port one and switching in order by port number. The remaining port is used for a calibration gas.

A packed column was attached to the end of the automatic switching port and connected to the infiTOF ion source. A 1 mL sample was introduced into the smartGC and separated by the packed column before ionization. The sample was measured using the infiTOF's high-resolution mode (20 laps). Detailed measurement conditions are listed in Table 1.

Table 1 Measurement conditions for automatic, multi-line sampling of CH₄ in air

Method Parameters	
Instrument	smartGC (MS-SG-02) infiTOF (MS-UHV-Pro)
Column	1/8inch -SUS tube "ShincarbonST" packing Size: 1.6 mm i.d. X 1.5 m
Column Temp.	200 °C
Carrier Gas	He
Flow Rate	20 cc/min
Ionization Energy	20 eV
infiTOF # of Laps	20 laps (High resolution)



Fig. 1 The smartGC-infiTOF system with seven sampling ports

Results and Discussion

Fig. 2 shows high-resolution mass chromatograms for CH₄ measurement from each port. Each peak was detected just before one minute of retention time and with similar S/N ratios. There appears to be very little variation between ports from automatic switching.

Conclusion

Our smartGC-infiTOF was used to measure CH₄ in air samples from seven sampling lines using automatic switching. The CH₄ mass chromatograms showed very little variation between ports for both S/N and retention time. These results show that Our GC-MS “smartGC-infiTOF” is effective for trace impurity analysis applications that require automatic switching of several different sampling lines.

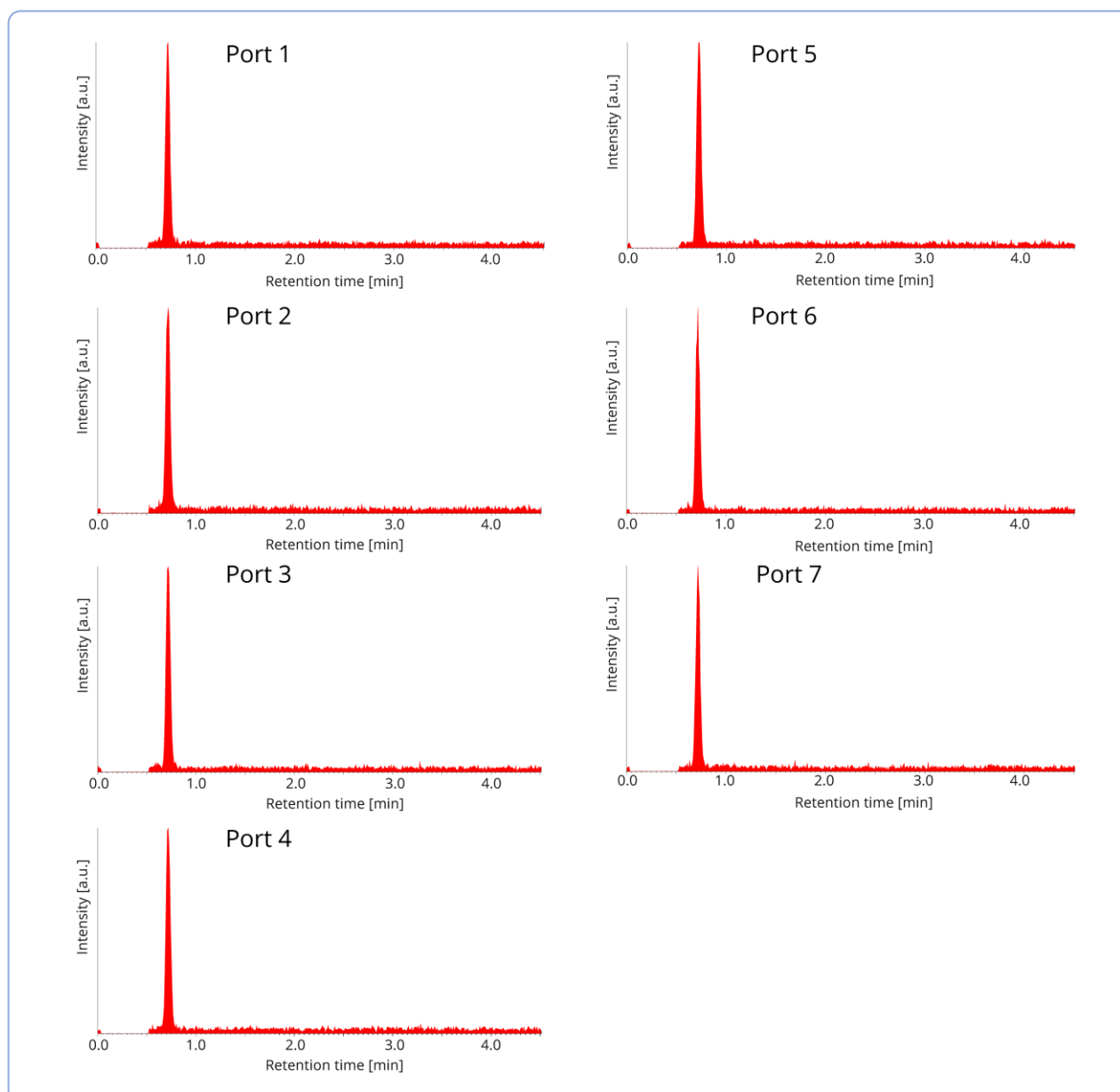


Fig. 2 High-resolution mass chromatogram of CH₄ for each sampling port using automatic switching

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