

Application Data Sheet

No. 55

GCMS

Gas Chromatograph Mass Spectrometer

Analysis of Inorganic Gas by GC-MS

Currently, inorganic gases are typically analyzed using a gas chromatograph – thermal conductivity detector system. This method usually involves using a packed column as the separation column. If a PLOT (porous layer open tubular) column with packing particles fixed to the column interior wall is used instead, however, similar results can be achieved using a gas chromatograph – mass spectrometer (GC-MS) system.

Experiment

Inorganic gas was analyzed using a Molecular Sieve 5A PLOT column. Table 1 shows the analysis conditions.

Table 1 Analysis Conditions

GC-MS : GCMS-QP2010 Ultra

Column: RT®-Msieve 5A (30 m long, 0.32 mm I.D., $df = 30 \mu\text{m}$) (Note 1)

[GC]

Vaporization chamber temperature: 200 °C

Column oven temperature: 35 °C (2 min) → (10 °C / min) → 150 °C (5 min)

Injection mode: Split

Control mode: Pressure (100 kPa)

Carrier gas: Helium

Split ratio: 50

Sample injection: Gas sampler (1 mL loop volume) (Note 2)

[MS]

Interface temperature: 200 °C

Ion source temperature: 200 °C

Measurement mode: Scan (m/z 10 to 100)

Event time: 0.5 sec

Ionization method: EI

Emission current: 150 μA

Note 1: It is recommended that an Rtx®-1 (5 m, 0.25 mm I.D., $df = 0.5 \mu\text{m}$) column be attached to the exit end (toward MS unit) of the column to trap particulates.

Note 2: Gas sampler P/N 223-57653-91

Analysis Results

A total ion current chromatogram is shown in Figure 1. This allows confirming that target components are separated adequately.

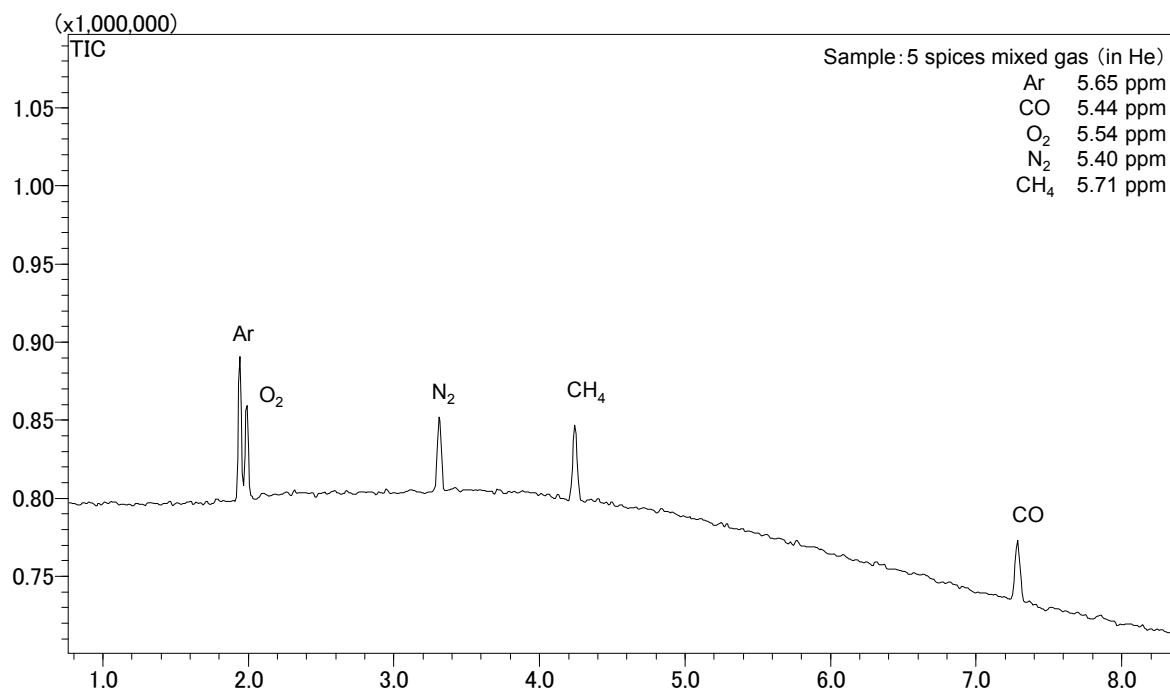


Fig. 1 Total Ion Current Chromatogram

Extracted ion chromatograms of respective components are shown in Figure 2.

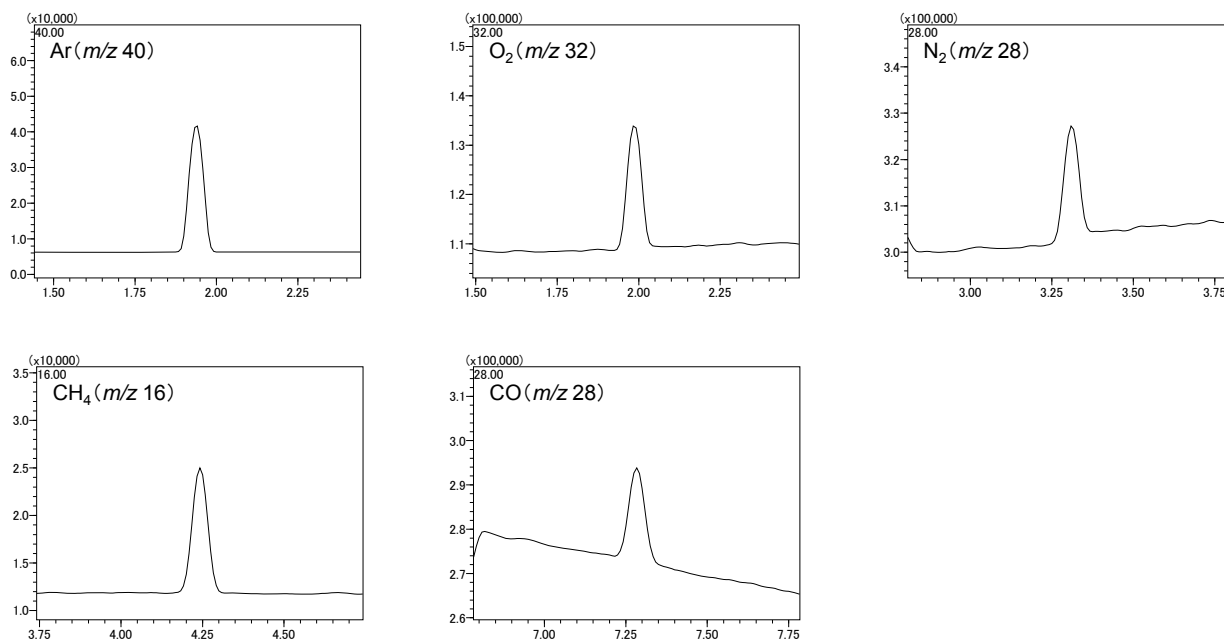


Fig. 2 Mass Chromatograms for Respective Components

Mass spectra for respective components are shown in Figure 3.

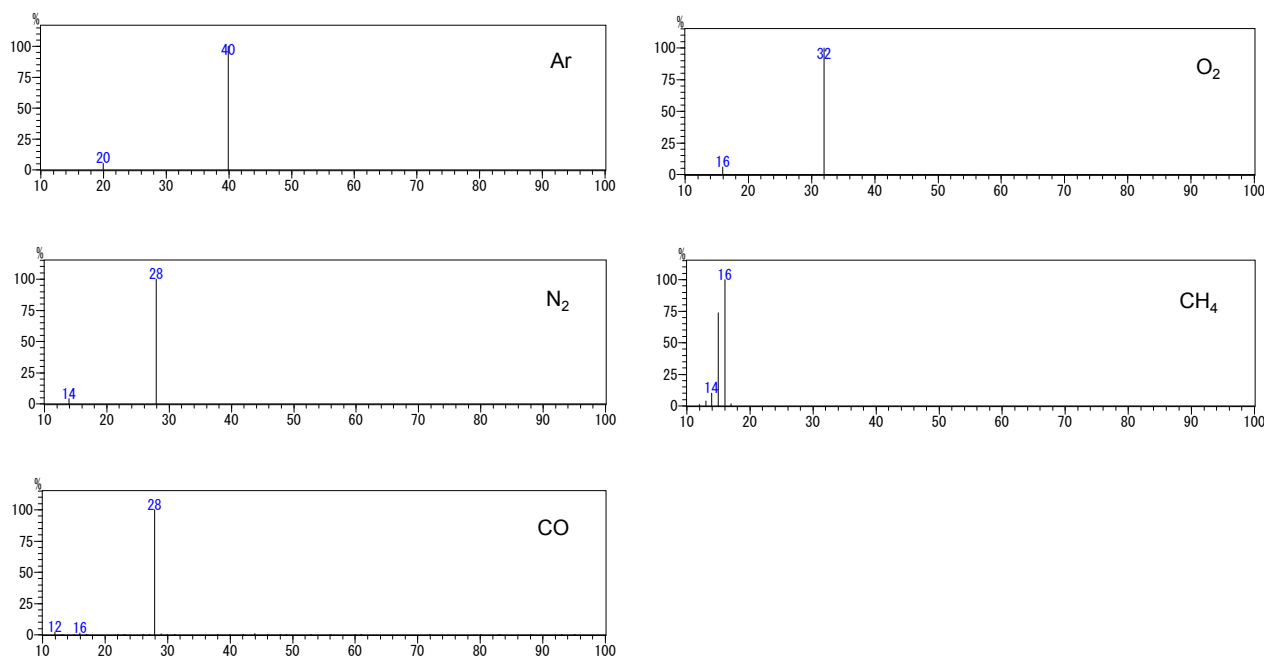


Fig. 3 Mass Spectra for Respective Components

