

Application Data Sheet

No.26

GCMS

Gas Chromatograph Mass Spectrometer

Analysis of Light Oil Utilizing a GC x GC-MS System

GC x GC systems use the latest chromatographic technology to achieve high-level separation through direct connection of 2 different types of columns. This method is optimal for the separation of target substances from complicated matrices that are problematic for ordinary GC or GC-MS systems, and for analysis by type from 2-dimensional chromatogram patterns. It can be used for analysis in a variety of fields, including natural products, foodstuffs, fragrances, environmental science, and petro chemistry.

Fig. 1 shows the analysis results of kerosene obtained using a GC x GC-MS system. By using a high-polarity column as the second column, it is possible to separate aromatic hydrocarbons from paraffin components. Consequently, a blob distribution pattern reflecting the compound structure was obtained.

Table 1: Analysis Conditions

| | | |
|----------------------------------|---|--|
| GC x GC modulator | : ZX1-GC x GC modulator | [MS] |
| GC-MS | : GCMS-QP2010 Ultra | Interface temperature: 240°C |
| [GC x GC] | | Ion source temperature: 200°C |
| Column | : 1st DB-1 (15 mL x 0.25 mmI.D., 1.0 μm) 2nd Rtx-WAX (2.5 mL x 0.1 mmI.D., 0.1 μm) | Solvent elution time: 0.3 min |
| Injection quantity | : 0.5μL | Data sampling time: 0.5 min to 150 min |
| Injection mode | : Split (split ratio 50) | Measurement mode: Scan |
| Vaporization chamber temperature | : 275°C | Mass range: <i>m/z</i> 35-500 |
| Column oven temperature | : 40 °C -> (1.8 °C /min) -> 240 °C (40 min) | Scan speed: 20,000 <i>u</i> /sec |
| Control mode | : Pressure (150 kPa -> (1.4 kPa/min) -> 300 kPa (40 min)) | |
| Modulation time | : 5 sec | |
| Hot pulse time | : 0.35 sec (300 °C) | |

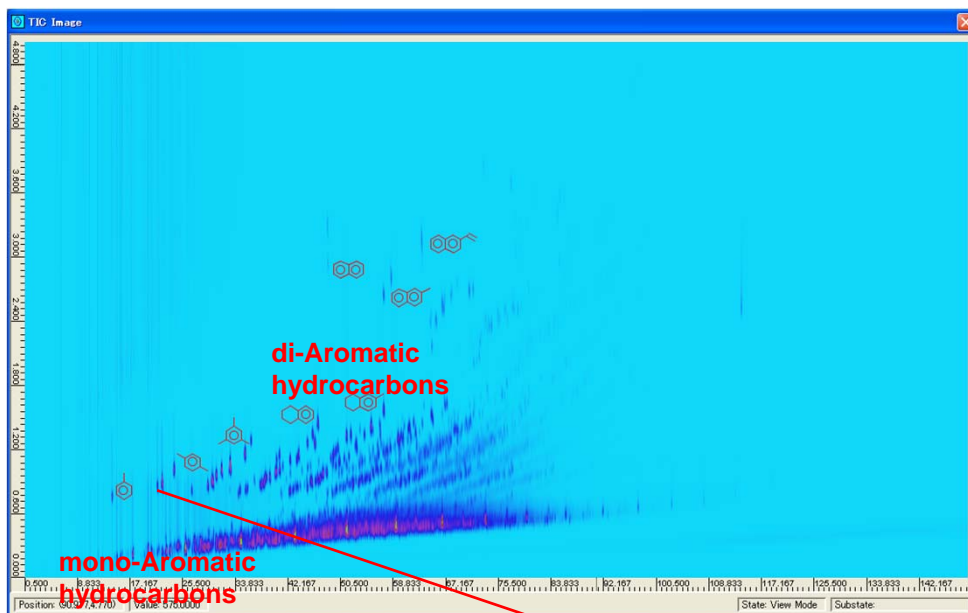


Fig. 1: 2-Dimensional Image of the GC x GC-MS Analysis Results for Kerosene