JEOL MS Data Sheet

MS Tips

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JMS-T100GC Application Data

Examining Selectivity using High Resolution Extracted Ion Current Chromatograms (EICC)

[Introduction]

Transformer oil containing no PCBs was diluted 10000 times, and then this solution was spiked with a mixture of commercially available PCBs (KC-500). The resulting sample was analyzed by using the JEOL AccuTOF-GC with FastGC/MS conditions. Afterwards, the data was examined by varying the mass range window (called “window width” in EICC generation) used for the PCB extracted ion current chromatograms (EICC) to determine if the effect of the background interference can be eliminated so that the analyte peaks are easily observed in the resulting data.

[Samples and Measuring Conditions]

Sample	KC-500 (0.1 ppm), transformer oil (diluted 10000 times)	
GC conditions	Sample inlet:	Splitless, 280°C
	Column:	DB-5, 10 m x 0.18 mm, 0.18 μm
	He flow rate:	0.5 ml/min (fixed flow rate)
	Oven:	50°C (2 min) → 60°C/min → 280°C (2 min)
MS conditions:	MS:	JMS-T100GC AccuTOF GC
	Ionization mode:	EI+ (ionization voltage: 70 eV, current: 300 μA)
	Mass range:	*m/z* 30 to 550
	Recording interval:	0.1 s (10 Hz)
	Temperature:	Ion source: 280°C, GC-ITF: 280°C

[Result and Discussion]

The window width for the EICC generation was varied to see if the chromatographic effect of the background interferences can be eliminated. Figure 1 shows the EICCs generated under low resolution (top) and high resolution (bottom) conditions. “Low resolution” and “high resolution” do not refer to the resolving power of the instrument, but instead refer to the different window widths used for the *m/z* 352.88 EICCs. The mass resolution levels calculated with the

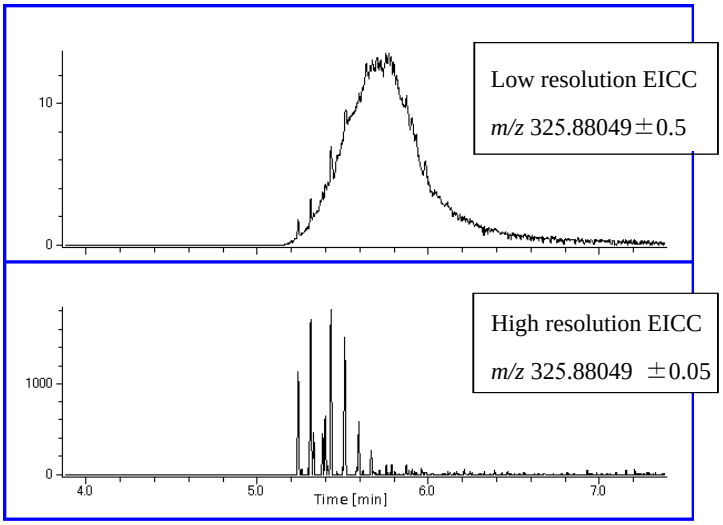

Figure 1. Comparison of mass chromatograms for penta-chlorinated PCBs in oil

different window widths are shown in Figure 1. The actual resolution for the data acquired by the AccuTOF GC during these sample measurements was R≧5000 @ *m/z* 293. As Figure 1 shows, the low resolution EICC (*m/z* 352.88049 ± 0.5, analogous to a quadrupole MS analysis) showed a wide, unresolved sample envelope that was caused by the transformer oil. Meanwhile, the high resolution EICC (*m/z* 352.88049 ± 0.05) eliminated the effect of the oil background, and extracted only the peaks for the penta-chlorinated PCBs.

[Conclusions]

These results demonstrate that the AccuTOF GC, a high resolution GC-TOFMS system, is a powerful tool for analyzing complex real-world samples that contain high levels of interfering impurities.