1.6 Analysis of Ethylene - Vinyl Acetate Copolymer (1) - GCMS

■Explanation

Polymers of increasing complexity are rapidly being developed for various applications. This analysis introduces an ethylene - vinyl acetate copolymer (EVA). Here, two types of analysis are possible through the use of a double-shot pyrolyzer (PY-2020D).

1) Evolved gas analysis method (EGA)

This involves constantly heating the sample and directly inducting the generated gas into a mass spectrometer (MS) to obtain data similar to TG-MS data.

2) Thermal decomposition (momentary thermal decomposition method and multi-stage thermal decomposition method)

This involves using two types of thermal decomposition (both differing from conventional thermal decomposition) applied to the same sample.

Fig. 1.6.1 shows EVA generated data using the evolved gas analysis method described in item 1). The initial peak is the detected acetic acid generated from the vinyl acetate. The m/z 57 peak showing hydrocarbon appears from around the 260 °C, denoting the decomposition of polyethylene. Figs. 1.6.2 and 1.6.3 show thermal decomposition chromatograms (400 °C and 550 °C) for the multi-stage thermal decomposition method.

■Analytical Conditions

Instrument	: GCMS-QP5050A PY-2020D (FRONTIER LAB.)
Column	: Ultra ALLOY + 5 0.25mm × 30m df 0.25 μm
Col.Temp.	: 50 °C (5min) - 320 °C (10°C/min)
Inj. Temp.	: 300 °C
I/F Temp.	: 280 °C
Carrier Gas	: 100kPa
Split	: 1:50

References

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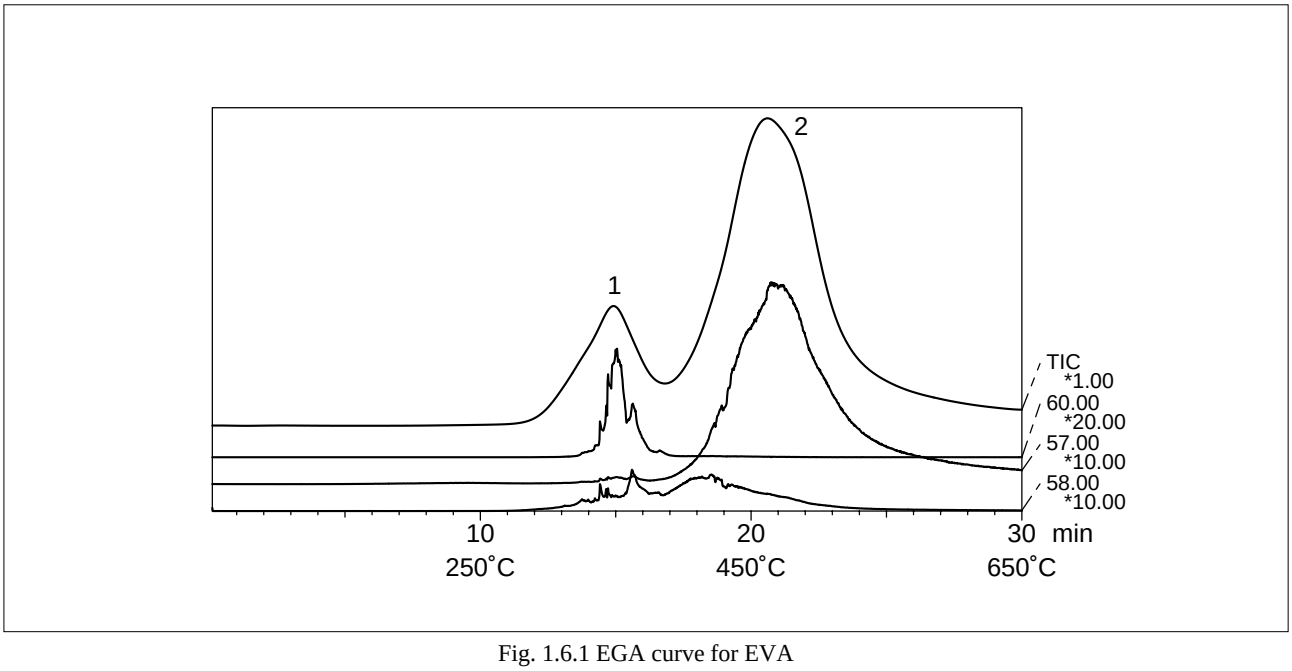

Fig. 1.6.1 EGA curve for EVA

1.6 Analysis of Ethylene - Vinyl Acetate Copolymer (2) - GCMS

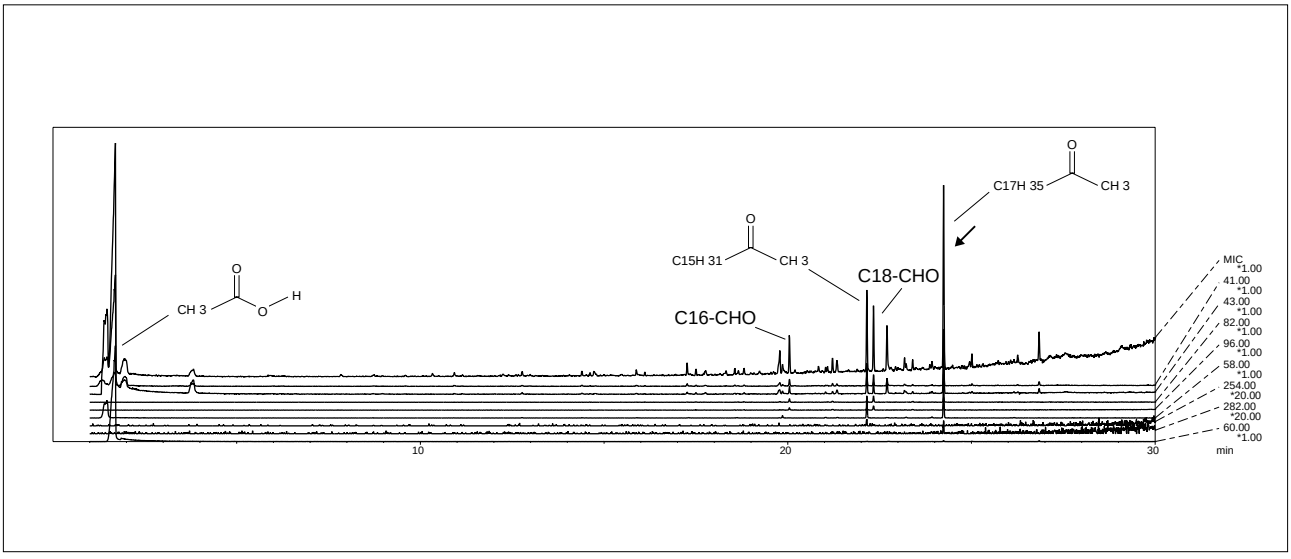

Fig. 1.6.2 Thermal decomposition chromatogram at 400 °C

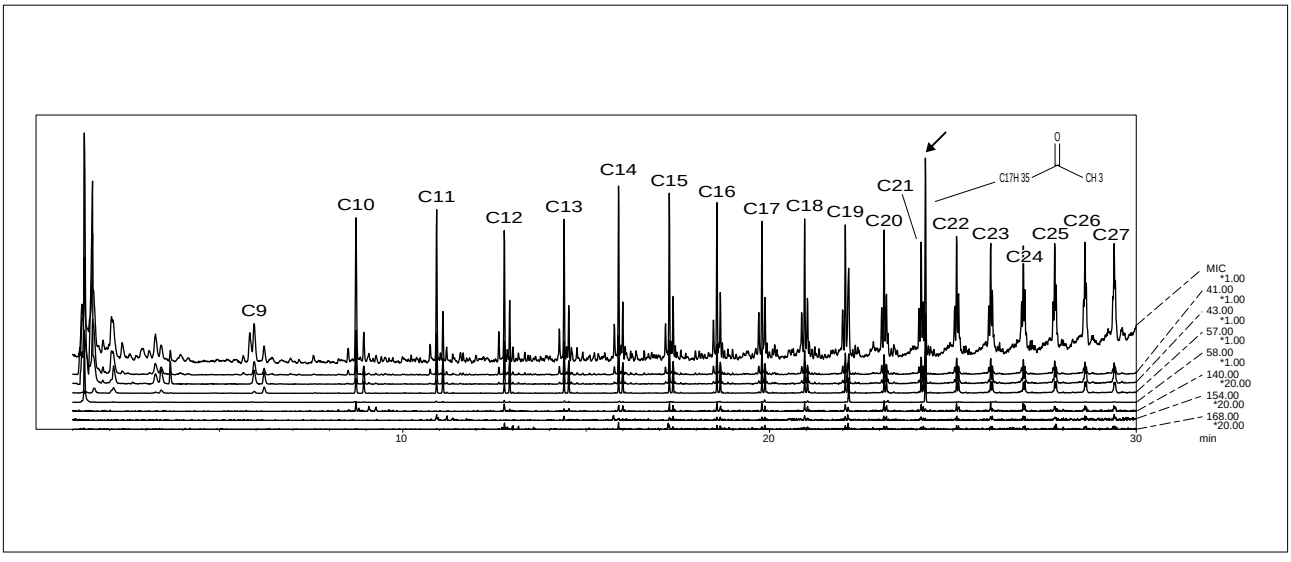

Fig. 1.6.3 Thermal decomposition chromatogram at 550 °C