

3.14 Analysis of Vulcanized Natural Rubber - GCMS

■ Explanation

Polymer samples like rubber cannot be directly injected into GC and GCMS. Normally, they are thermally decomposed using a pyrolyzer and the decomposed components qualitatively analyzed.

The product material from that decomposition is complicated and requires MC (mass chromatography) to simplify the task of qualifying the components.

Introduced here is an example of analysis targeting a sulfur compound and another example focusing on alkyl benzene and naphthalene compounds. Fig. 3.14.1 shows MC targeting the detection of the sulfur compound. Analysis shows peak A to be thiophene, peak B to be methyl thiophene, peak C to be benzothiophene and peak D to be benzothiazole. Fig. 3.14.2 shows MC with molecular weights for the targeted alkyl benzene

compound. This type of analysis enables reliable determinations of these compounds.

■ Analytical Conditions

Instrument : GCMS-QP1100 PYR-4A
Column : DB-1 0.2mm × 25m df 0.25 μm
Col.Temp. : 50 °C-250 °C (10 °C/min)
Inj.Temp. : 300 °C
I/F Temp. : 280 °C
Carrier Gas : 100kPa
Pyrolysis Temp. : 800 °C

References

Application News No. M103

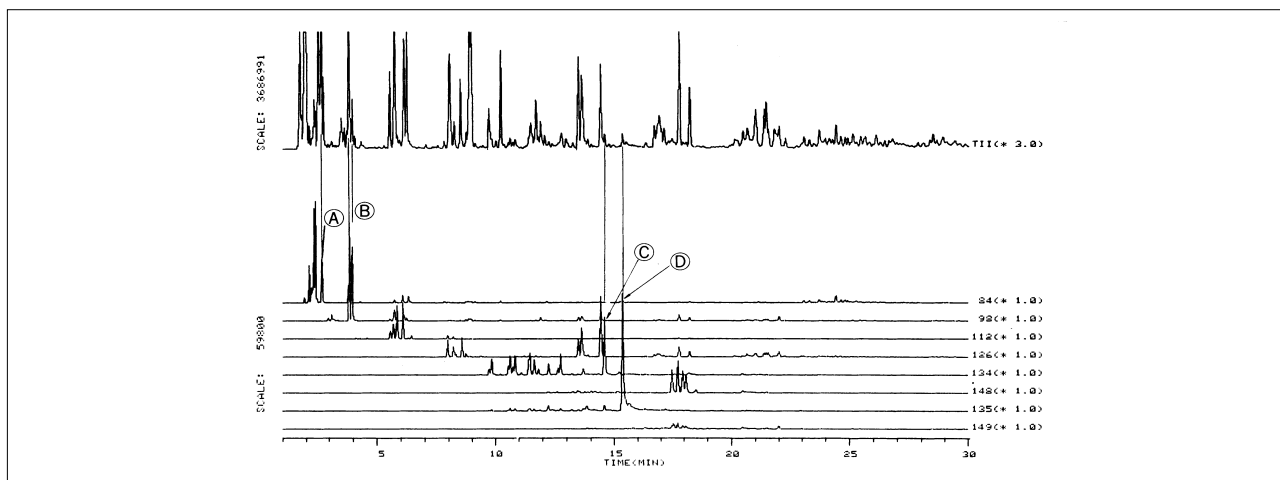


Fig. 3.14.1 Vulcanized natural rubber MC

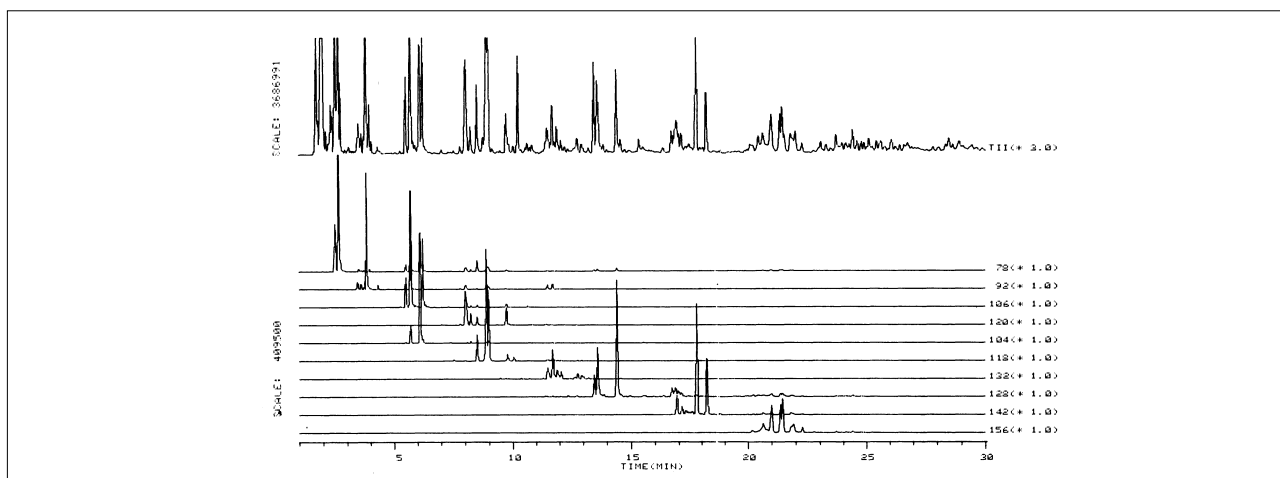


Fig. 3.14.2 Vulcanized natural rubber MC