



## Analysis of Acrylonitrile Butadiene Rubber (NBR) by Double-Shot Technique

Because polymeric materials are generally blends of basic polymers and additives, pyrograms obtained by conventional single-shot technique (instant pyrolysis) include both additives and thermal decomposition products of the basic polymer, and this often makes analysis difficult. On the other hand, double-shot technique (multistep pyrolysis) is useful because volatile components are thermally desorbed at the first stage, then instant pyrolysis of the basic polymer follows. Analysis of NBR is described here as an example. Fig 1 shows a pyrogram of NBR by single-shot method. Thermal decomposition products and additives are shown on a single pyrogram, it is difficult to distinguish the peaks of basic polymer from those of additives. In the double-shot technique (Fig. 2); however, volatiles and additives are eluted off in the first step, whereas thermal decomposition products of basic polymer come off in the second step, allowing much easier identification of peaks. Conditions for thermal desorption and pyrolysis can be determined from EGA curve obtained in evolved gas analysis technique. See PYA3-001E for details.

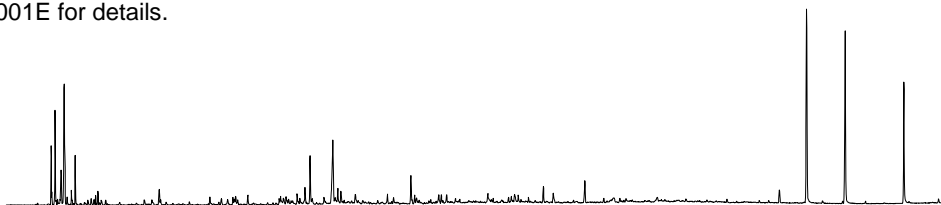


Fig. 1. Pyrogram of NBR by Single-Shot Technique (Total ion chromatogram)

PY: Double-Shot Pyrolyzer (PY-2020D), Detector : MS, Scan range : m/z=29-400  
Pyrolysis temp.: 550°C, Carrier gas : He, Column flow rate : 1.0ml/min, Carrier total flow rate : 100ml/min  
Separation column : Ultra ALLOY-5 (5% phenyldimethylpolysiloxane), 30m, 0.25mm id, Film thickness : 0.25µm  
GC oven temp.: 40°C 3min 10°C/min 300°C (3min), GC injection port temp.: 320°C, Sample : 0.31mg

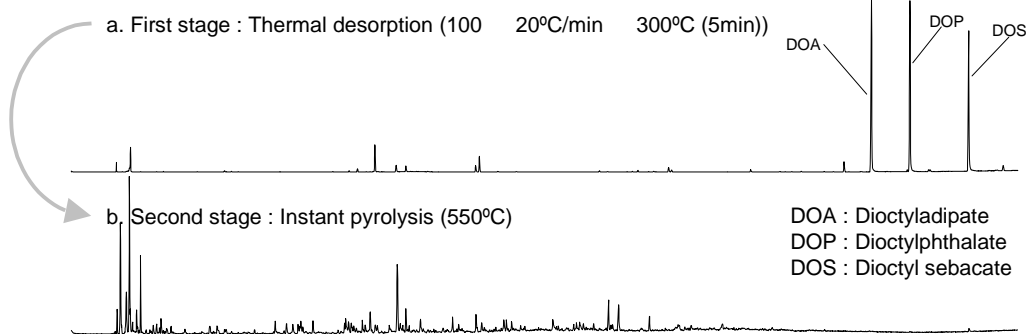


Fig. 2. Pyrogram of NBR by Double-Shot Technique

Analytical conditions are the same as above (Fig. 1.)

Keyword : Double-Shot Technique, NBR, Additives, Thermal Extraction, Thermal Desorption Analysis, DOA, DOP, DOS

Application : General Polymer Analysis

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