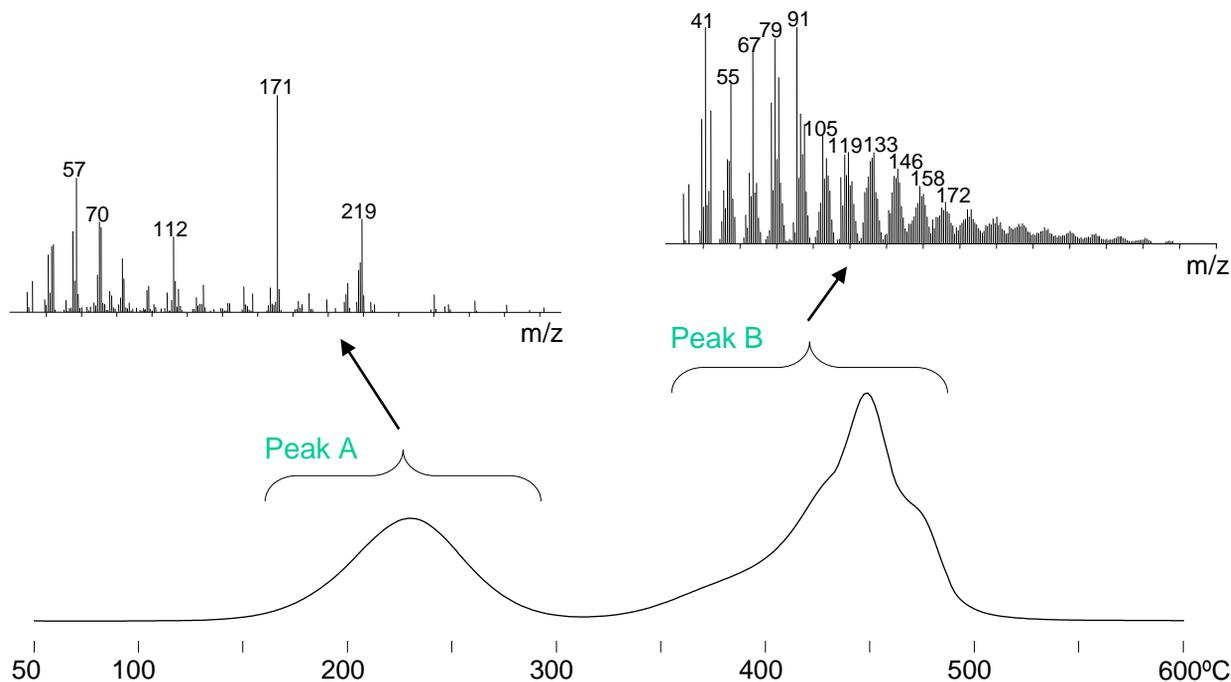


## Analysis of Rubber components with EAG and EGA Polymer MS Library (EGA-MS LIB)

The EGA-MS technique is a combination of Evolved Gas Analyzer coupled with mass spectrometer using Double-Shot Pyrolyzer; and is very useful as a primary searching technique for unknown polymer samples. An example shown below is the analysis of a rubber of unknown composition. Shown in Fig. 1 are the EGA curve of the rubber and mass spectra of peaks A and B observed. Peak A is considered to arise from a variety of additives due to low elution temperatures. To obtain further information, components in peak A need to be trapped at the GC column head, followed by GC/MS analysis (see *Double-Shot Pyrolyzer® Technical Notes*, PYA1-004E, and PYA1-005E). Peak B is considered to be originated from thermal decomposition of the polymer backbone due to high elution temperatures. Table 1 shows the result of EGA-MS LIB search performed on the average spectrum of peak B. Polynorbornene and Acrylonitrile-butadiene rubber were found as plausible polymers. Library search employing EGA and EGA-MS LIB provides a plenty of information on the amount and desorption temperatures of additives contained in a sample, and is very useful for analysis of unknown materials as a primary search technique.

**Table 1 Result of Library Search on Peak B**

Name	Qual
1. Polynorbornene	: 49
2. Polynorbornene	: 43
3. Acrylonitrile-butadiene rubber	: 43



**Fig. 1 Evolved Gas Curve of a Rubber and Averaged Mass Spectra**

Pyrolysis temp.:50~600°C (10°C/min), Carrier gas : He 50kPa, 60ml/min, Split ratio :ca.1/50  
 EGA tube : id 0.15mm, Length 2.5m (UADTM-2.5N), GC oven temp. : 300°C  
 Injection temp.: 320°C, Sample :ca. 0.5mg, Detector : MS, Scan range : m/z=29-400, Scan speed: 0.1 scans/sec  
 PY-GC interface temp.: 320°C (AUTO mode)

**Keywords :** Additives, Rubber, Evolved Gas Analysis, Library Search

**Products used :** Multi-functional pyrolyzer, F-Search, UADTM-2.5N

**Applications :** General Polymer Analysis, Rubber Related Industries

**Related technical notes :**

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