Analysis of Antioxidants in Acrylonitrile Butadiene Rubber (NBR)

Part 2 : Reproducibility in Quantitative Analysis

Volatile components in NBR were thermally desorbed using conditions developed in Technical Note PYA1-004E (Furnace programmed from 100ºC to 350ºC at 10ºC/min, then holding for 5min). The chromatogram is shown in Fig. 1. Quantitative analysis was performed on the antioxidants NOCRAC 810-NA and NOCRAC 6C by the internal standard method. Table 1 shows the results. The concentrations of NOCRAC 810-NA and NOCRAC 6C were both determined to be about 3,000ppm, with reproducibilities of 1.98% and 1.27%, respectively. This demonstrates the excellent reproducibility obtained from the Double-Shot Pyrolyzer.

Table 1. Reproducibility of Area Ratios (vs ISTD) of NBR additives

n	NOCRAC 810-NA	NOCRAC 6C
1	0.113	0.139
2	0.118	0.140
3	0.119	0.144
4	0.122	0.143
5	0.124	0.140
6	0.123	0.144
7	0.123	0.144
8	0.124	0.143
Aver.	0.122	0.143
RSD	1.98 %	1.27 %

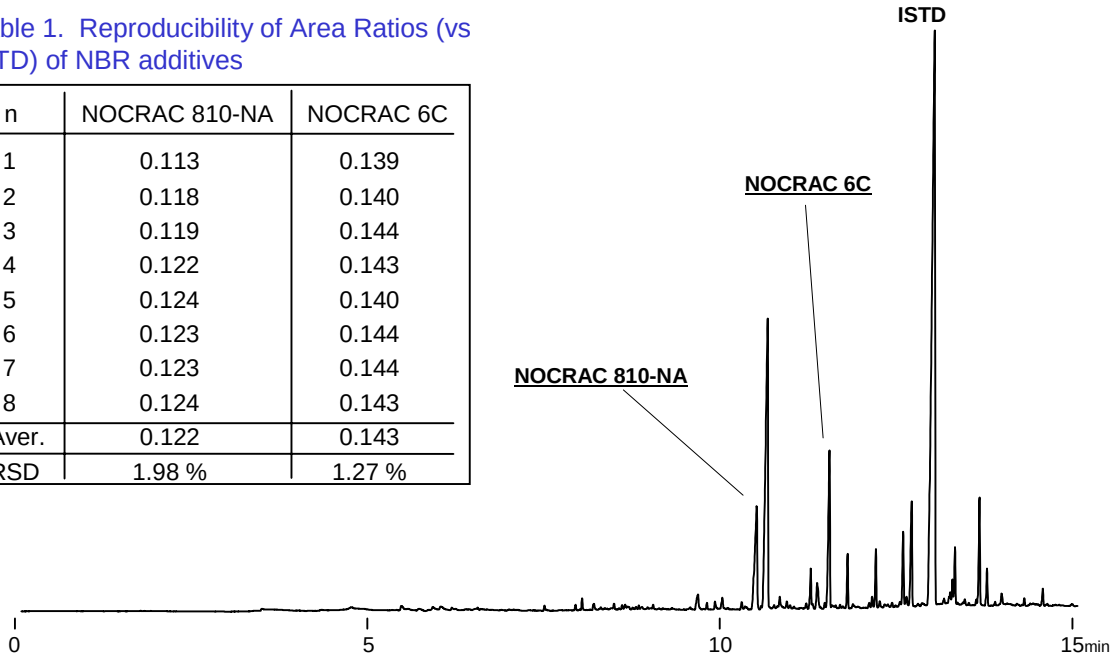

Fig. 1 Chromatogram of Thermally Desorbed Components from NBR

Pyrolyzer : Double-Shot Pyrolyzer (PY-2020D), Detector: Flame ionization detector (FID)
Furnace temp.: 100→10ºC/min→350ºC (5min)
Carrier gas : He, Column flow rate: 1.2ml/min, Carrier gas flow rate: 150ml/min
Separation column : Ultra ALLOY^{+}-1 (dimethypolysiloxane), Length :30m, 0.25mm id, Layer thickness : 0.25µm
GC oven temp.: 40→20ºC/min→320ºC (1min), Injection port temp. :320ºC, Sample : ca.1mg

Keyword : NBR, Thermal Desorption, Quantitative Analysis, Reproducibility, Additive, Antioxidant, NOCRAC 810-NA, NOCRAC 6C

Application : General polymer analysis, Rubber industry

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