Composition Analysis of a Multi Component Acrylate Copolymer

NMR is used in composition analysis of polymers, however; its resolution is often inadequate for analysis of multi component copolymers. NMR alone therefore will not be good enough for detailed analysis. In these situations, Py-GC technique is extremely useful as a supplemental analytical tool. Fig. 1 shows ^{1}H-NMR spectrum of an acrylate copolymer which comprises of eight components as shown in Table 1. Because of poor resolution, peaks are heavily overlapping, making the analysis difficult. On the other hand, a pyrogram of the same sample obtained by Py-GC is shown in Fig. 2. Each peak is found to be well defined with all the components (except for AA) detected. As shown here, Py-GC technique coupled with NMR makes detailed analysis possible.

Table 1. Monomers of Acrylate Copolymer and Their Abbreviations

$CH_2=C(CH_3)COOCH_3$ **MMA**	$CH_2=CHCOOH$ **AA**	$CH_2=CHCOOCH_2CH(Et)C_4H_9$ **2EHA**
$CH_2=C(CH_3)COOEtOH$ **HEMA**	$CH_2=CHCOOEtOH$ **HEA**	C_6H_5-$CH=CH_2$ **ST**
$CH_2=C(CH_3)COOC_4H_9$ **BMA**	$CH_2=CHCOOC_4H_9$ **BA**	

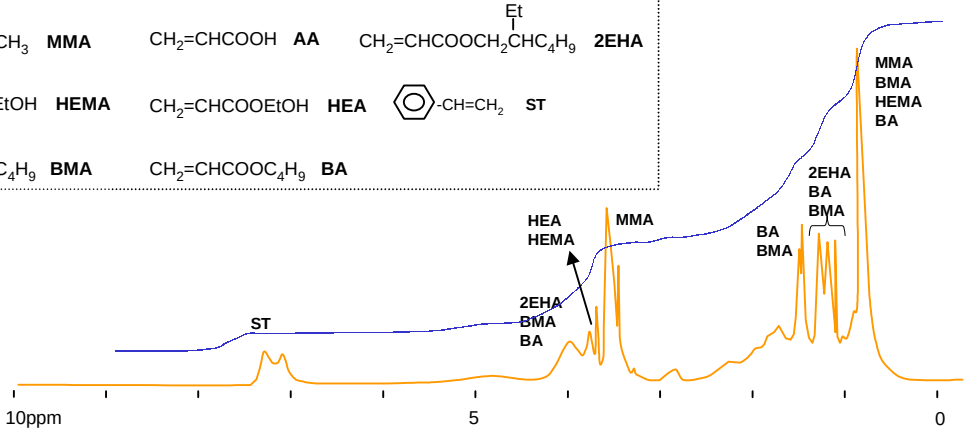

Fig. 1 1H-NMR Spectrum of 8-Component Acrylate Copolymer

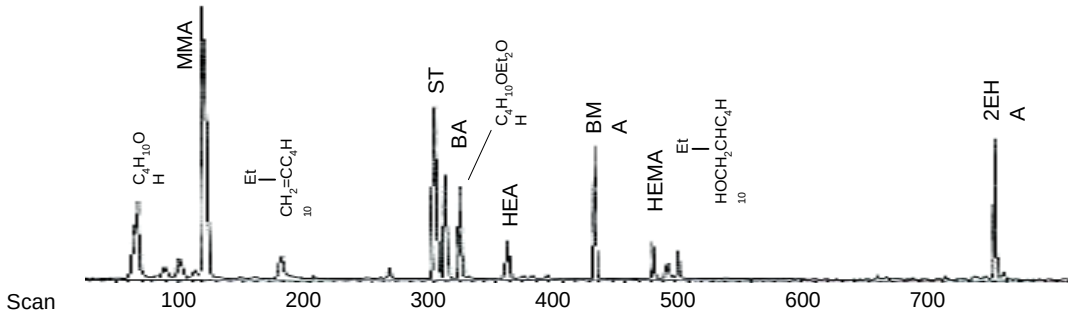

Fig. 2 Pyrogram of 8-Component Acrylate Copolymer (Amount of sample: 0.02mg, Pyrolysis : 550ºC)

Reference : N. Sato, 2nd PY seminar in 1998 (hosted by Frontier Lab), page 6-6

Keyword : Acrylate, Copolymer, Composition Analysis, NMR

Application : General Polymer Analysis

Please forward your inquiries via our web page at: (http://www.frontier-lab.com/), or send us a fax message.

R&D and manufactured by:

Frontier Laboratories Ltd.

1-8-14, Saikon, Koriyama,
Fukushima, 963-8862 Japan

Phone: 81-24-935-5100 Fax: 81-24-935-5102

® : Registered trademark of Frontier Laboratories Ltd.

Your dealer: