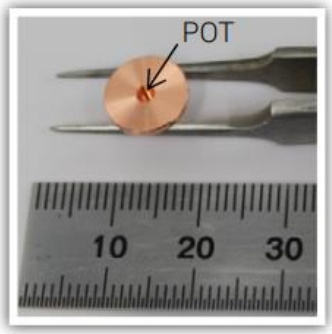
The Quick Discrimination of Nylon by ionRocket-DART®-MS

EI-002

Background



Nylon, the synthetic polymer and aliphatic polyamide, is one of the most widely used industrial polymers. Nylon is widely diffused due to its high rigidity and elasticity. nylon-6,10 and nylon-6,12 reflect similar tendencies in FT-IR spectrum. In addition, the melting temperatures of both polymers measured by DSC are approximately 220℃. This makes it difficult to discriminate between the two analogs.

Samples

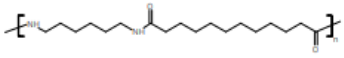
nylon-6,10 and nylon-6,12 (e.g. toothbrush).

Methods

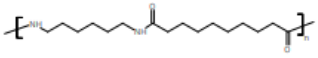
The analyzing tool was the ionRocket heating system connected to the DART®-MS (Direct Analysis in Real Time - Mass Spectrometry). Small quantities of the samples were put on the POT and analyzed. The temperature was increased by 100℃ per minute, from 30℃ to 600℃.

Results

TIC is shown in Fig 1. MS spectra measured at 300℃ is shown in Fig 2.
In Fig 2, the monomers and dimers were mainly observed.
The comparisons of ionRocket-DART®-MS spectra made it possible to distinguish between nylon-6,12 and nylon-6,10.



nylon-6,12



nylon-6,10

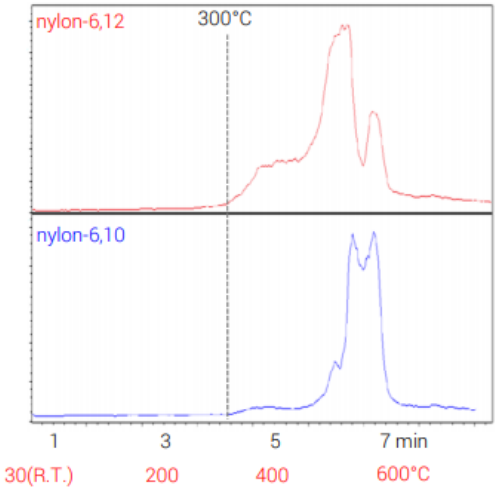


Fig. 1 TIC of each sample.
R.T. 100°C/min 600°C

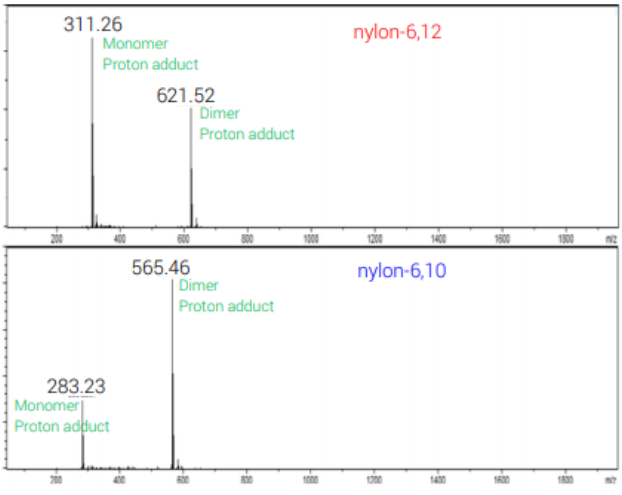


Fig.2 MS spectrum measured at 300°C
The preset temperature of DART®-SVP was 400°C
Ionization was DART® positive.

Target

Material development, chemical industry, foreign material analysis

BioChromato
Mining ideas, Aiding laboratories

ionRocket

Web : https://biochromato.com/
Email : oversea@bicr.co.jp