

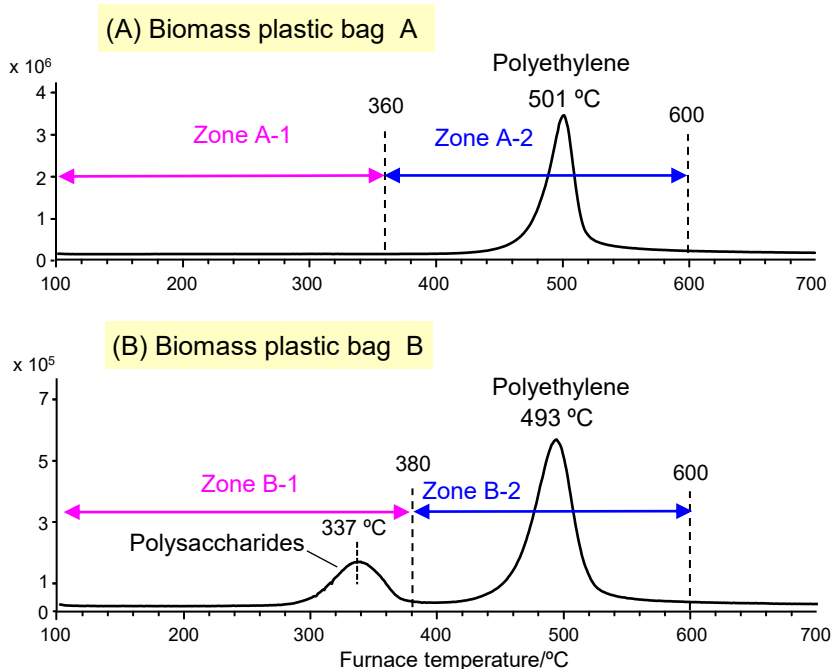
Analysis of biomass plastic bags

Part 1: Evolved gas analysis (EGA)-MS

[Background] With the global depletion of resources and concerns about environmental pollution caused by plastics, environmentally friendly biomass plastics are drawing attention. Biomass plastic is a plastic made from renewable biological resources. It looks just like standard plastics, but most of it is made from inedible parts of plants. In recent years, analysis methods for the major components of biomass plastics have been paid much attention. In this note, two types of commercially available biomass plastic bags were analyzed by evolved gas analysis (EGA)-MS and the results are described.

[Experimental] The unprinted part of a plastic bag (Fig. 1) was cut into small pieces using a cutting knife and was placed in an Eco-Cup LF as a sample. A GC/MS system with a Multi-Shot Pyrolyzer (EGA/PY-3030D) directly interfaced to the GC injector was used for measurements. The GC injector and the MS detector were connected through a deactivated metal tube (UADTM-2.5N). EGA-MS analysis was run on two types of biomass plastic bags and EGA thermograms were obtained.

[Results] The EGA thermograms of Biomass plastic bags A and B are shown in Fig. 2. For Biomass plastic bag A, a peak at 501 °C was observed in Zone A-2. For Biomass plastic bag B, a small peak was observed in Zone B-1. Based on the description on the plastic bag B, this peak is due to the thermal decomposition of polysaccharides derived from Rice Resin. In Zone B-2, a peak at 493 °C was observed. Two peaks observed at 501 °C (A) and 493 °C (B) are derived from polyethylene by their average mass spectra. The small difference in the peak temperature can be attributed to the differences in the polyethylene used.



Furnace temp.: 100 - 700°C (20 °C/min), GC inj. temp.: 300°C, GC oven temp.: 300°C
Split ratio: 1/50, EGA tube: deactivated metal capillary tube (L=2.5 m, id.=0.15 mm)
Column flow rate: 1.0 mL/min (He), MS scan range: m/z 29 - 550, Sample amount: 200 µg

Fig. 1 Logos and description of plastic bags

* Rice Resin® is a registered trademark of Biomass Resin Minami Uonuma Co.

Keywords : EGA-MS, Biomass plastic, Plastic bag

Products used : Multi-functional pyrolyzer, Eco-Cup LF, UADTM-2.5N, Vent-free GC/MS adapter, F-Search

Applications : Bioplastics, General polymer analysis

Related technical notes : [PYA1-119E](#), [PYA1-120E](#)

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Frontier Laboratories Ltd.

Phone: (81)24-935-5100 Fax: (81)24-935-5102
www.frontier-lab.com