

[Development of pyrolysis-fractography](#)

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Abstract:

As a novel method for analytical pyrolysis of polymers, pyrolysis-fractography (Py-F) was developed. In this method, the pyrolyzates generated when a polymer is instantaneously pyrolyzed at 600°C are introduced together with the carrier gas into a short length of deactivated stainless steel capillary tube equipped in the gas chromatographic oven. By a programmed heating the oven temperature is linearly raised, so that the pyrolyzates are fractionated, and a fractogram is obtained using a mass spectrometer or a flame ionization detector. The fundamental study was conducted using polyethylene, and this method was applied to elucidate the pyrolysis behavior of such nitrogen containing polymers as polyurethane and melamine formaldehyde resin. As a result, the Py-F method was proved to be useful in analyzing the pyrolysis behavior of polymeric materials, such as a nitrogen-containing polymer, that generates highly polar components upon pyrolysis.

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Frontier Labs Products used:

Multi-functional Pyrolyzer (PY-2020iD), polymer prepper