

Analysis of Polypyromellitimide (PI) by Reactive Pyrolysis

When analyzing condensation polymers such as polypyromellitimide (PI) by Py-GC technique, reactive pyrolysis in the presence of tetramethyl ammonium hydroxide (TMAH) gives methylated derivatives of the constituent monomers. Fig. 1 shows a pyrogram obtained by flash pyrolysis of PI, and Fig 2 shows a pyrogram obtained by reactive pyrolysis in the presence of TMAH. Flash pyrolysis technique gave aromatic products arising from fission of the main chain and hydrogen abstraction, such as phenols, amines, nitrile, and imides. On the other hand, reactive pyrolysis at 400° C gave methyl derivative of oxydianiline, that is the constituent monomer of PI as shown in the pyrogram (Fig. 2).

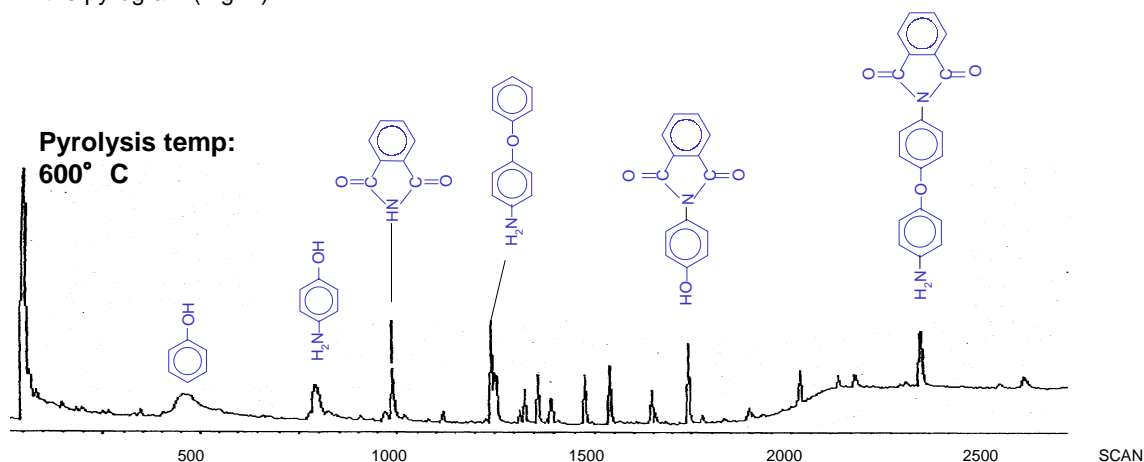


Fig. 1 Pyrogram Obtained by Flash Pyrolysis of Polypyromellitimide

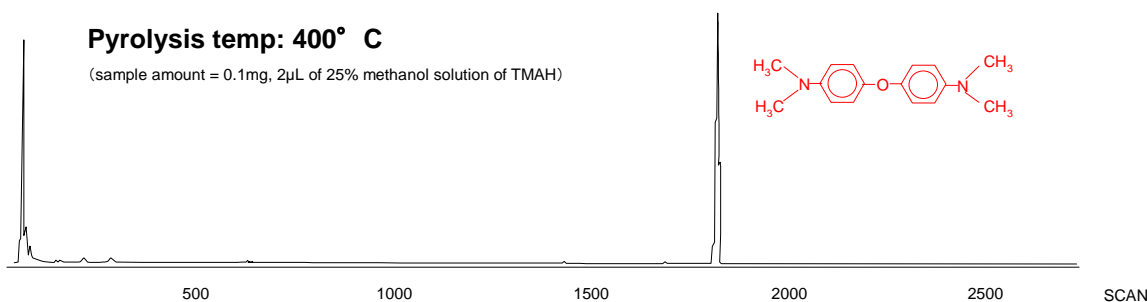


Fig. 2 Pyrogram Obtained by Reactive Pyrolysis of Polypyromellitimide

Carrier gas: He, Injection port pressure: 103kPa, Split ratio: 1/60, Separation column: Ultra ALLOY®-5 (5% diphenyldimethylpolysiloxane)
Length: 30m, Id: 0.25mm, Film thickness: 0.25µm, GC oven temp: 40-300°C (20°C/min), GC injection port tem: 320°C

Material excerpted from "Analysis of Polymeric Materials by Pyrolysis GC/MS", Sato (Toray Research Center),
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Keyword: Polypyromellitimide, PI, Monomer, Reactive Pyrolysis, Tetramethyl Ammonium Hydroxide, TMAH

Applications : General Polymer Analysis

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