



Analysis of Residual Oligomers in Polystyrene (PS) Part 1 : Thermal Extraction in Evolved Gas Analysis (EGA)

Solvent extraction is generally used in analysis of residual oligomers in PS; however, complicated pretreatment is required. Therefore, simpler method is desired. Using our Double-Shot Pyrolyzer, a quantitative analysis by simpler thermal extraction was performed. The analysis requires 100% extraction of the target components without any interfering components. However, PS produces oligomers in trace amounts upon heating to 300°C. Thermal extraction conditions must be carefully determined. Fig. 1 shows the setup of evolved gas analysis (EGA). As shown in Fig. 2, a tiny peak originating from the residual oligomers in PS is observed in 100°C to 260°C region. Thermal extraction conditions for the residual components will be studied in the technical note that follows.

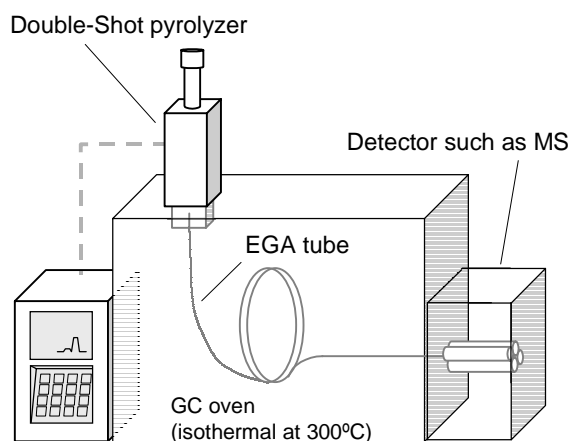


Fig. 1. Double-Shot Pyrolyzer and Evolved Gas Analysis with GC/MS

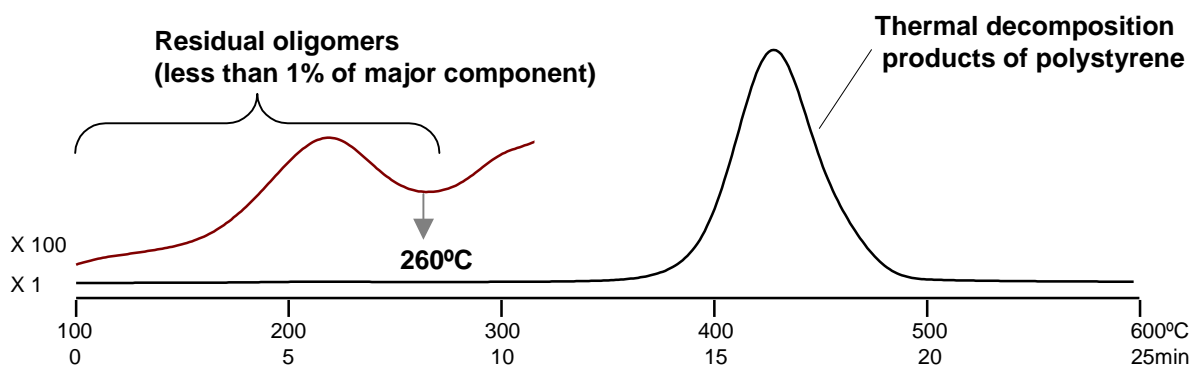


Fig. 2 Evolved Gas Analysis of PS

Pyrolysis furnace temp.: 100°C 600°C (20°C/min), Carrier gas: He 50kPa, 60ml/min, Split ratio: ca. 1/50
EGA tube: 0.15mm id, Length 2.5m (UADTM-2.5N), GC oven temp.: 300°C, Injection port temp.: 320°C
Sample: ca. 0.2mg, Detector: MS, PY-GC interface temp.: 320°C (AUTO mode)

Keyword : Oligomer, Polystyrene, Thermal Extraction, Evolved Gas Analysis

Application : Environmental Pollution, Manufacturing Process, Polymers

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