

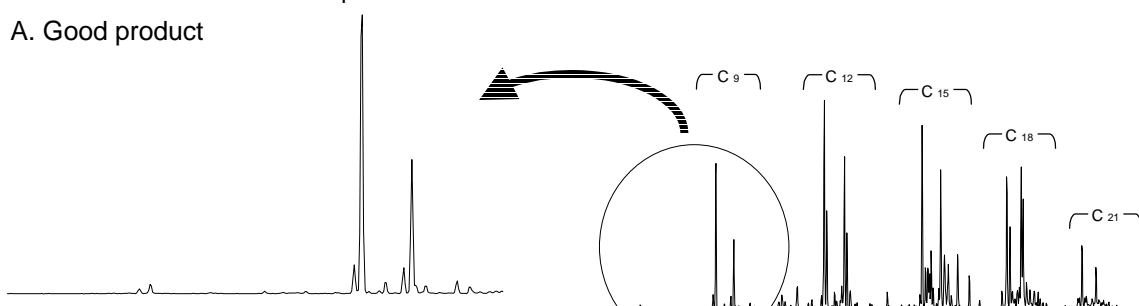


Analysis of Offensive Odor Components in Polypropylene (PP) Pellets

Some residual oligomers and additives in plastics can be objectionable or even harmful to humans. This is especially important in the food packaging industry. Here is an example of the determination of offensive odor components produced during the injection molding of polypropylene (PP), using the Double-Shot Pyrolyzer, PY-2020D.

Fig. 1 shows chromatograms of components released from PP when heated from 50°C to 100°C. Both good material and defective material which produces offensive odors were analyzed. This temperature range was determined using Evolved Gas Analysis (EGA), Technical Note PYA3-001. The results in Fig.1 show that similar patterns of oligomers are detected in both good and defective material. However, some low-boiling alcohols were observed only in the defective products, and were identified as the cause of the odors. This example demonstrates the value of thermal desorption-GC/MS coupled with EGA in resolving problems with odor and other harmful evolved material in plastics.

A. Good product



B. Defective product

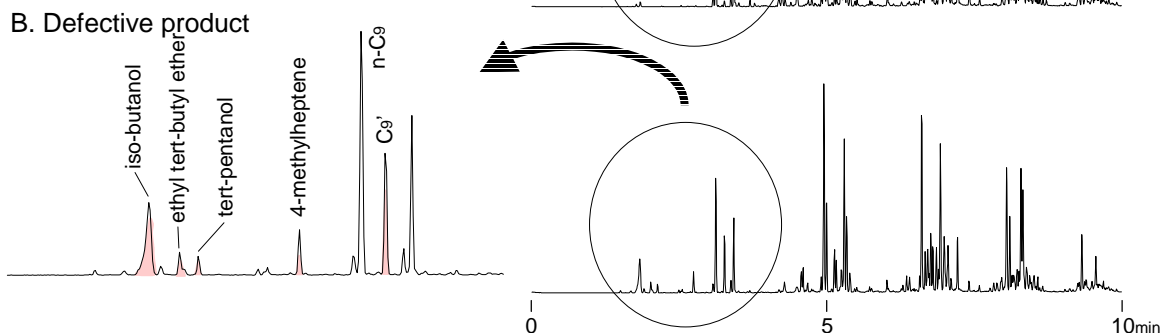


Fig. 1. Comparison of Volatiles in PP Pellets of Good and Defective Material

PY : Double-Shot Pyrolyzer (PY-2020D), Cold trap : Microjet Cryo-Trap (MJT-1030E)
Detector : Mass spectrometer (mass scan range : m/z=29-400), Thermal desorption temperature : 50→10°C/min→100°C (5min)
Carrier gas : He, Column flow rate : 1.0ml/min, Split ratio : 1/20
Separation column : Ultra ALLOY™-5 (5% diphenylpolysiloxane), Length 30m, 0.25mm id., Layer thickness 0.25µm
GC oven temperature : 40→20°C/min→240°C, GC injection temperature : 320°C, Sample : ca. 7mg

Keyword : Polypropylene, Offensive Odor, Volatile Components, Thermal Desorption

Application : General Polymer Analysis, Manufacturing Process Management, Quality Assurance

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