



# Composition Analysis of Adhesives Using Double-Shot Pyrolyzer and Peripheral Devices

Part 1: EGA and Library Search with EGA-MS LIB

The EGA-MS library search is a combination of Evolved Gas Analysis, a thermal analysis technique using Double-Shot Pyrolyzer, and mass spectrometry; and is very useful as a primary searching technique for unknowns. An example shown below is analysis of an adhesive with unknown composition. Shown in Fig. 1 are the EGA curve of the adhesive and averaged spectra obtained from regions A, B, and C with the background (BG) subtracted. Peak A was considered to arise from a low boiling component by its elution temperature, and was found to be a compound shown in Fig. A by a normal MS library search (Wiley275). Wiley275 library search was also performed on peak B, which was found mainly to be of acetic acid which could be produced by scission of the polymer side chain. Table 1 shows library search results by EGA-MS LIB performed on peak C, and various vinyl polymers were found. Because peak B contains acetic acid, the material should contain vinyl acetate. As shown in this example, EGA-MS technique and library search with EGA-MS LIB are extremely useful as a primary library search technique for determination of composition of unknown samples. See *Double-Shot Pyrolyzer® Tech Note PYA1-014E* for the analysis of regions A~C by EGA-GC/MS technique.

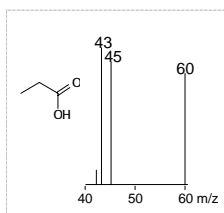
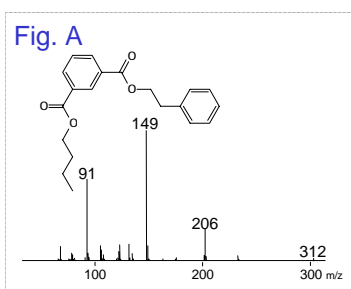


Table 1: Library Search Result of Peak C

Name	Qual.
1. Poly (vinyl chloride) ; PVC	: 62
2. Poly (vinyl acetate) ; PVAc	: 60
3. Poly (vinyl alcohol) ; PVA	: 43

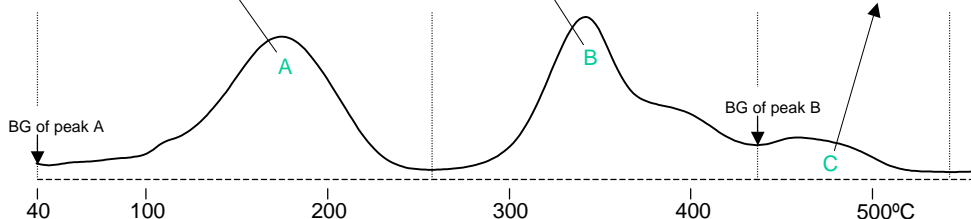
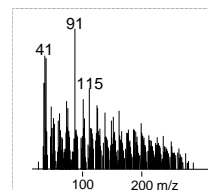


Fig. 1 EGA Curve of the Adhesive

Pyrolysis temp.: 100°C-600°C (20°C/min), Carrier gas : He 50kPa, Split ratio : ca. 1/50  
EGA capillary tube : 0.15mm id, 2.5m (UADTM-2.5N), GC oven temp.: 300°C  
Injection temp.: 320°C, Amt. of sample : ca. 1.0mg, Detector : MS (m/z=29-400, 0.1scan/sec)  
PY-GC interface temp.: 320°C (AUTO mode)

Keyword : Adhesive, Evolved Gas Analysis, Library, Search

Applications : General Polymer Analysis, Adhesive Industry

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