Correlation Between Evolved Gas Analysis and Thermal Gravimetric Analysis with the Double-Shot Pyrolyzer

Evolved Gas Analysis, EGA, coupled with a Double-Shot pyrolyzer is a simple thermal analytical technique in which the polymer temperature is continuously increased, and the gases produced are detected and analyzed in real time. This produces information about volatile components in the sample, and start and end temperatures of thermal decomposition. Fig. 1 shows the EGA setup. The GC injection port and detector are connected with a deactivated metal capillary tube, 2.5m long and 0.15mm id, which is held isothermally at 300ºC in the GC oven. In Fig. 2, an EGA curve for polyvinyl acetate, PVAc, correlates well with the TGA data.

The EGA apparatus based on a pyrolyzer and GC/MS has some other advantages. The mass spectrometer permits identification of evolved materials, and selected ion monitoring can give the evolved profile of single compounds. The GC oven makes it easy to clean out high-boiling material after analysis. Conventional TGA apparatus does not have these advantages.

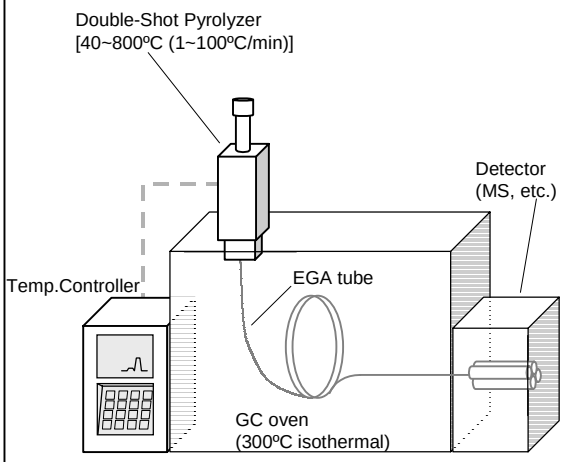

Fig. 1 Setup of Evolved Gas Analysis

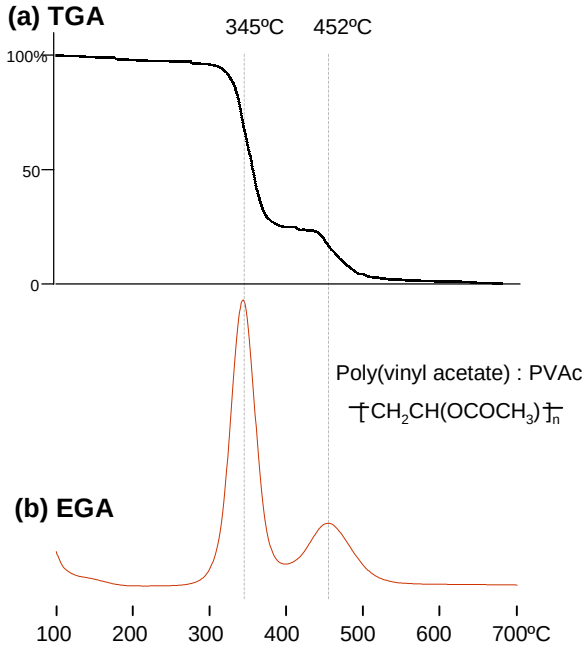

Fig. 2 Analysis of PVAc With EGA and TGA

Keyword : EGA, TGA, Correlation, Thermal Analysis

Application : General Polymer Materials

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