

## **The development of a new MS pyrolyzates library for the identification of polymeric materials**

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The qualitative analysis of polymeric materials is a relatively difficult task even when using advanced analytical methods such as chemical analysis, spectroscopic, chromatographic and thermal methods. Of all these technologies, analytical pyrolysis (Py/GC/MS) is the most widely used technique for the characterization of the polymeric materials even for intractable polymers with three dimensional structures. Today, the reproducibility of pyrolysis GC/MS is as good as any chromatographic method which can be attributed to the precise control of the pyrolysis temperature, the advent of a vertical, micro-furnace and the continuing improvements in capillary column GC/MS systems. These three factors have made possible the compilation of a pyrolyzate data base which can be used for the routine identification of polymeric materials using PY-GC/MS.

The first pyrogram library, containing data for 135 polymers was published by Tsuge and Ohtani in 1989. Commonly used, commercial libraries, however, do not include the pyrolyzates of most polymeric materials. In response to a growing demand for a dedicated library of pyrograms and the associated pyrolyzates, we developed a new pyrolyzates MS library and the necessary interpretation software using the micro-furnace pyrolyzer (Frontier Laboratories Ltd). The library contains about 3,800 MS spectra together with retention indexes and related physical, chemical and chromatographic data for 165 representative polymers. The pyrolyzate MS library provides the analyst with an easy-to-use library which greatly simplifies the identification of unknown polymeric materials. This presentation will discuss the utility of the search program and the library by providing a number of examples.