Application Note TA-TGMS-Pharm

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TG-MS analysis of thermal behavior of commercial pharmaceutical products

Introduction

Thermal behavior of a commercialized pharmaceutical product was analyzed by means of thermogravimetric differential thermal analysis – photoionization mass spectrometry, TG-DTA-PIMS. It becomes easy to elucidate the thermal process of the pharmaceutical products, and the analytical precision and the efficiency of measuring are improved greatly, because the gaseous components that respond to the weight losses by heating can be distinguished in real time and observe in the molecular ion state by the effect of soft-ionization mass spectrometry.

Example of measurement and analysis

The treatment of high blood pressure syndrome, angina, and arrhythmia (main ingredient: metoprolol tartrate) was measured by TG-DTA-EI/PIMS, and a comparison between the EI and the PI spectra obtained in the evolution gas peak of 200℃ is illustrated in Figure 1.

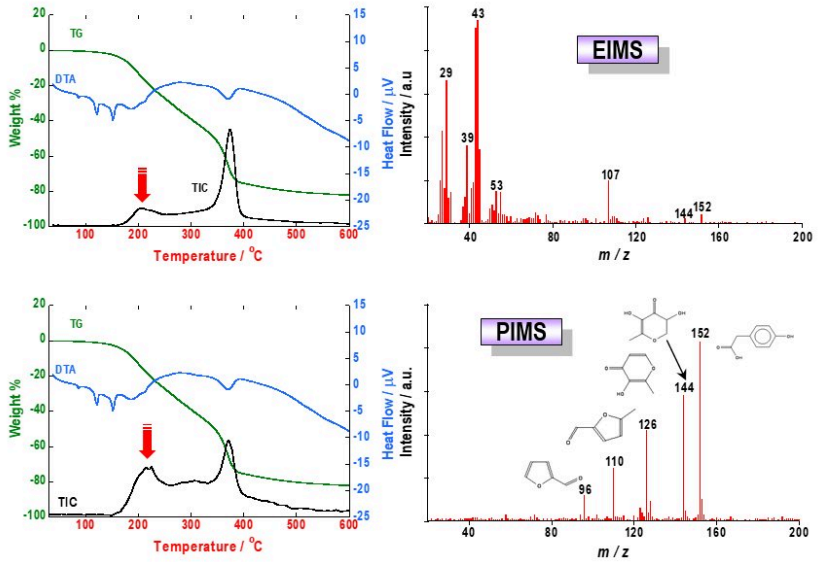

Figure 1: Comparison of TG-DTA-EIMS and TG-DTA-PIMS results for thermal process of commercialized pharmaceutical product. Top: TG-DTA-EIMS and EI mass spectrum; Bottom: TG-DTA-PIMS and PI mass spectrum

As shown in the traditional EIMS, because the ions of many kinds of evolution gases overlap mutually, it is hard to identify the pyrolysates directly from the obtained EI mass spectrum. On the other hand, the PIMS spectrum brought by the effect of the soft ionization enables real-timely the interpretation composing five different kinds of compounds of m/z 96, m/z 110, m/z 126, m/z 144 and m/z 152 as shown in the figure.

Reference

[1] T. Arii, “TG-DTA-Photoionization mass spectrometry equipped with skimmer type interface,” *Rigaku Journal*, **41** (2010), No.2, 20-25.

Related products

ThermoMass Photo

An integrated thermal analysis instrument capable of high-precision mass analysis of evolved gases without breaking the molecules, allowing direct measurement.