# AccuTOF-GCv Series

## Analysis of Organogermanium Compounds by Field Desorption (FD) Ionization

**Introduction**

Organogermanium compounds are organometallics that contain a carbon to germanium chemical bond. Germanium shares group 14 in the periodic table with silicon, tin and lead and the chemistry of organogermanium is somewhat similar to that of organosilicon compounds and organotin compounds. While metallic germanium is widely used in semiconductor devices, infrared light sensors, etc., organogermanium is advocated as a non-toxic alternative to many toxic organotin reagents.
In this work, we report the analyses of organogermanium compounds by field desorption (FD) using the JMS-T100GC "AccuTOF-GC" time-of-flight mass spectrometer.

**Method**

Sample:
3 organogermanium compounds (see Fig. 1)

MS Conditions

| | |
|---|---|
| Mass spectrometer: | JMS-T100GC "AccuTOF-GC" |
| Ionization mode: | FD(+) |
| Cathode potential: | -10 kV |
| Emitter current: | 0 mA → 51.2 mA/min → 35 mA |
| Acquired mass range: | *m/z* 35 – 800 |
| Spectral recording interval: | 1.0 sec |

**Results and Discussion**

Fig. 2 shows the acquired FD mass spectra for each organogermanium compounds. Additionally, Fig. 2 shows a comparison between the observed and simulated isotope clusters (insets) and the accurate masses measured for each monoisotopic sample peak (with their corresponding errors).

By using FD, the molecular ions are clearly observed for all the organogermanium compounds analyzed. The observed isotope cluster patterns, which were rather complex and typical for organometallic compounds, agreed very well with the simulated patterns that are expected for these compositions. Furthermore, the measured accurate masses of the monoisotopic peaks were within ~5 ppm of the calculated exact masses.

**Conclusions**

The FD method available with the AccuTOF-GC time-of-flight mass spectrometer is an invaluable technique for analyzing organometallics. Quick and confident identification is possible by observing molecular ions, comparing isotope cluster patters with simulated ones, and from accurate mass measurements, as shown by the analyses of organogermanium compounds reported in this work.

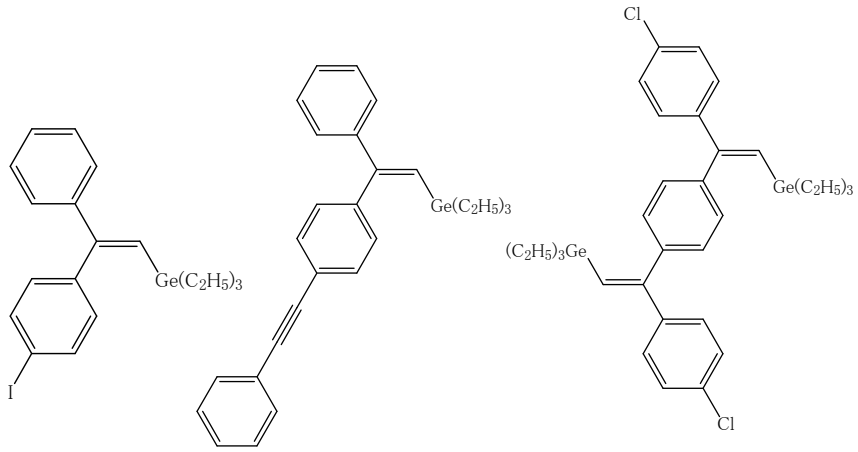


*Fig.1 Three organogermanium sample compounds.*



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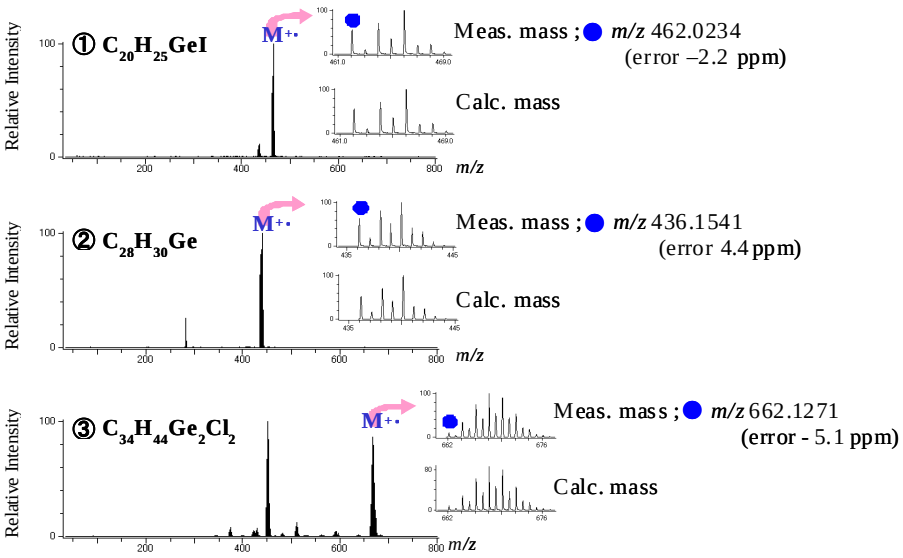


*Fig.2 FD mass spectra, comparisons between observed and simulated isotope clusters, and accurate mass measurement results for the organogermanium compounds.*

**Reference**

T. Kataishi, H. Oku, M. Ubukata, Y. Takahashi, T. Nakano et al, Appl. Organometal. Chem., 2008, **22**(12), p665-670.