

Analysis of organogermanium compounds by field desorption (FD) ionization using JMS-T100GC "AccuTOF GC"

Introduction

Organogermanium compounds are organometallic compounds containing 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.

Here we report the analyses of organogermanium compounds using JMS-T100GC "AccuTOF GC" time-of-flight mass spectrometer.

Methods

Samples

Three organogermanium compounds

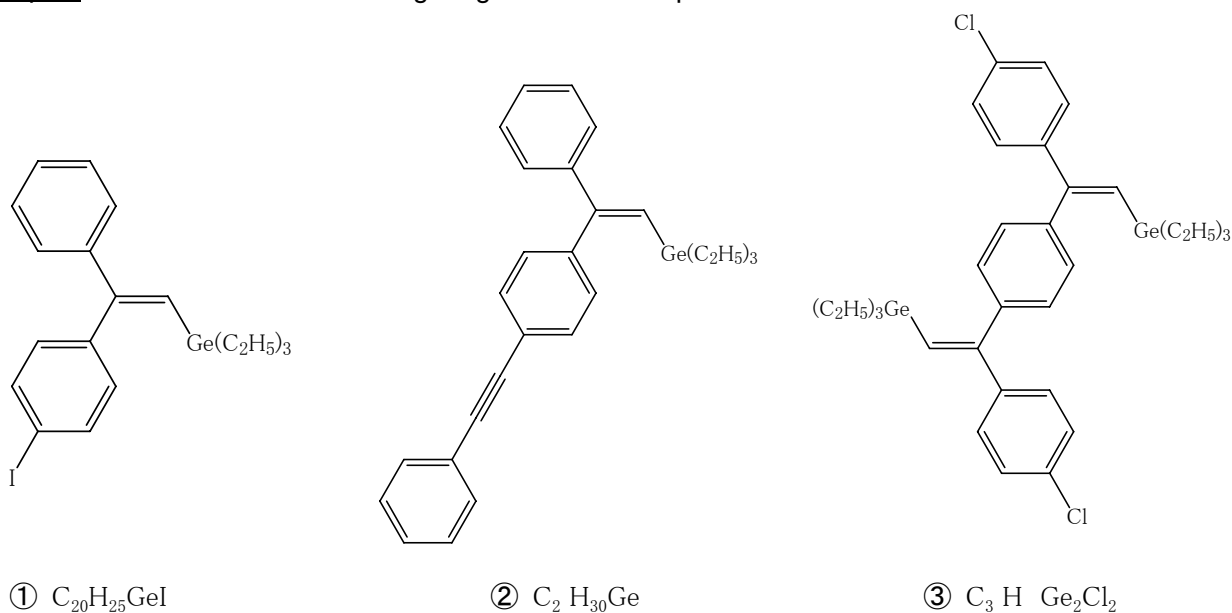


Fig.1 Structural formulae of the samples

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

Acquired FD mass spectra, comparisons between observed and simulated isotope clusters, and measured accurate mass of the monoisotopic peaks are shown in Fig. 1.

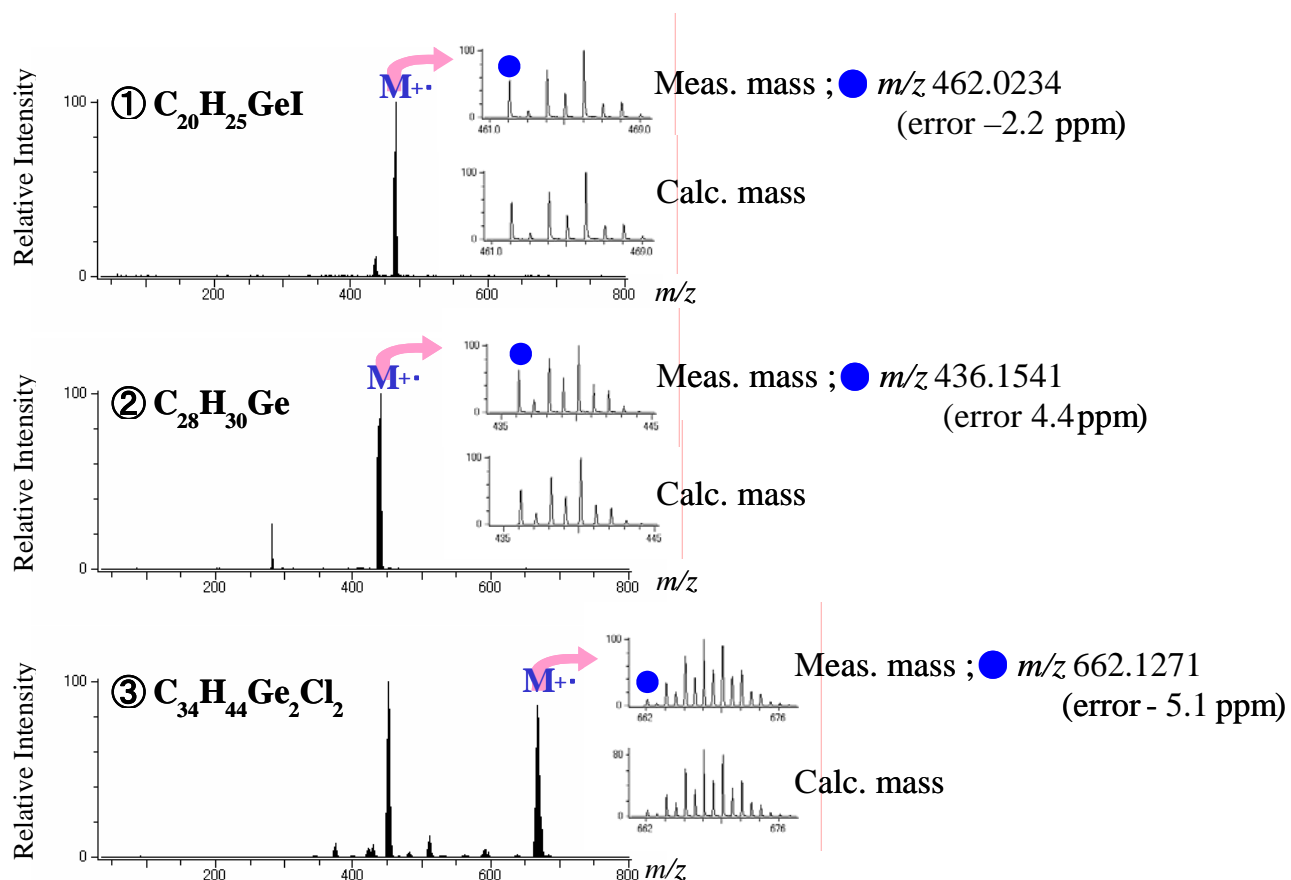


Fig.1 FD mass spectra, comparisons between observed and simulated isotope clusters, and accurate mass measurement results for the organogermanium compounds.

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 those simulated from the literature values. The measured accurate masses of the monoisotopic peaks were within 5 ppm of the calculated exact masses.

Field desorption (FD) on JMS-T100GC "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 patterns with simulated ones, and from accurate mass measurements, as exemplified by the analyses of organogermanium compounds reported above. (U-JT)

Reference

T. Kataishi, H. Oku, M. Ubukata, Y. Takahashi, T. Nakano et al, Appl. Organometal. Chem., to be submitted.

Acknowledgement

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