

Abstract

FT-ICR STUDIES OF METAL-CARBON BINARY CLUSTERS, MASAMICHI KOHNO (Eng. Res. Inst., Univ. Tokyo, Bunkyo-ku, Tokyo 113-8656), SHUHEI INOUE (Dept. Mech. Eng., Univ. Tokyo) and SHIGEO MARUYAMA (Eng. Res. Inst., Univ. Tokyo).

Metal-carbon binary cluster ions were produced by the laser-vaporization supersonic-expansion cluster ion beam source, and measured by the Fourier Transform Ion Cyclotron Resonance (FT-ICR) mass spectrometer. Fig. 1 shows positive mass spectra of MC_n^+ ($M = \text{Sc}, \text{La}$). For La-C case, no pure carbon clusters were observed, whereas pure carbon clusters with almost the same intensity of MC_n were observed for Sc-C case. Even-numbered MC_n ($n = 2m$) clusters with especially abundant MC_n ($n = 44, 50, 60$) were observed for both positive and negative ions. Geometrical structures of these clusters were discussed through these characteristic mass distributions and chemical reaction experiments. As a result, it was speculated that MC_n ($n = 44, 50, 60$) had fullerene-like caged structures with a metal atom encapsulated inside.

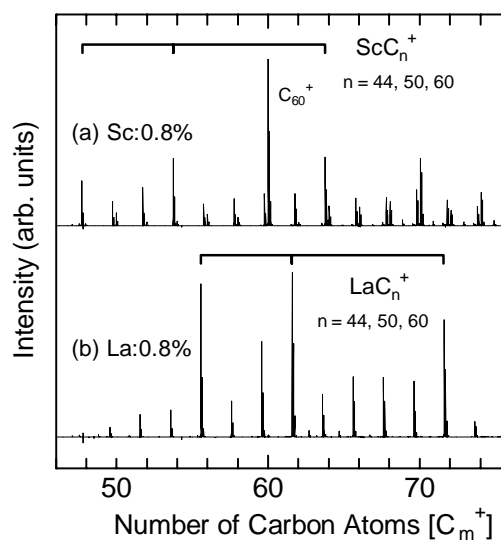


Fig. 1 Examples of Mass spectra