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Dissociation channels of c-C_4F_8 to CF_2 radical in reactive plasma
TOSHIO HAYASHI, K. ISHIKAWA, M. SEKINE, M. HORI, A. KONO, Nagoya University, K. SUU, ULVAC Inc. — c-C_4F_8 has been widely used in the area of dielectric etching in microelectronics fabrication processes. This trend brought about many experimental studies, in which CF_2 radical was a main component in c-C_4F_8 plasmas. This is the basis of the model of c-C_4F_8 dissociation to CF_2 through C_2F_4. Font et al. [1] considered comparatively the dissociation cross sections (σ) of c-C_4F_8 obtained by many researchers and finally adopted the$\sigma$and rate coefficient estimated by Radtke et al. [2]. However, the main dissociation channels are yet unclear. Theoretical studies were reported for C_2F_4 excited states and electron interactions by Winstead and Mckoy [3], and Yoshida et al. [4]. The energy of the dissociation channel to CF_2 showed good agreement with the electron attachment value obtained by Goyette et al. [5]. However, they did not mention the excitation dissociation of neutral C_2F_4. Therefore, studies for dissociation reactions of c-C_4F_8 and C_2F_4 are limited and yet ambiguous. We calculated the dissociation channels of c-C_4F_8 and C_2F_4 using *Gaussian 03* program, in order to clarify the main dissociation channels.
[1] G. I. Font et al., J. Appl. Phys., 91 (2002) 3530. [2] M. T. Radtke et al., J. Vac. Sci. Technol., A21 (2003) 1038. [3] C. Winstead and V. Mckoy, J. Chem. Phys., 116 (2002) 1380. [4] K. Yoshida et al., J. Appl. Phys., 91 (2002) 2637. [5] A. N. Goyette et al., J. Chem. Phys., 114 (2001) 9832.

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