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**Time-Programmed Plasma CVD for Detailed Structure Control of Single-Walled Carbon Nanotubes** TOSHIAKI KATO, RIKIZO HATAKEYAMA, Department of Electronic Engineering, Tohoku University — Detailed structure control of single-walled carbon nanotubes such as tube diameter, chirality, and length is indispensable for a variety of application fields. We have established a novel method for controlling the diameter, chirality, and length distributions at the same time based on time-programmed plasma CVD. Precise time evolution growth [1] reveals that there is a clear dependence of tube diameter on the incubation time, which is narrowed by strictly controlling their growth time at the initial stage. In addition, the length distribution is also fairly narrow and almost all of SWNTs are very short ( $\sim 100$  nm) in the case of such narrow diameter-distributed SWNTs. Furthermore, photoluminescence study [2] reveals that the chirality distribution at the initial growth stage is also fairly narrow and only a few chirality species are included in this sample.

[1] T. Kato and R. Hatakeyama: Appl. Phys. Lett. 92 (2008) 031502.

[2] T. Kato and R. Hatakeyama: J. Am. Chem. Soc. 130 (2008) 8101.

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