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Chirality-resolved kinetic analysis of single-walled carbon nanotube growth by *in-situ* Raman spectroscopy TAKASHI UCHIDA, MASAYA TAZAWA, HIROSHI SAKAI, AKIRA YAMAZAKI, YOSHIHIRO KOBAYASHI, NTT BASIC RESEARCH LABORATORIES TEAM, CREST/JST TEAM, TOKYO UNIVERSITY OF SCIENCE COLLABORATION, MEIJI UNIVERSITY COLLABORATION — We investigate the chirality-resolved growth kinetics of single-walled carbon nanotubes (SWCNTs) by *in-situ* Raman spectroscopy. The SWCNTs are synthesized by ethanol CVD from Co nanoparticle catalysts with predefined size before the CVD process. The chirality-sensitive radial breathing mode (RBM) signals in Raman spectra are observed during the CVD process at 80-120 Pa. We have reasonably assigned the chiral indices of the RBM signals observed at higher temperature during the CVD process by taking into account the temperature dependence of the resonance condition of SWCNTs. The growth kinetics analyzed from the time evolution of each RBM signal in *in-situ* spectra reveals that the nanotube nucleation occurs just after the supply of the carbon source gas and does not significantly depend on the growth pressure and chirality. In addition, we have found that the growth duration depends on the growth pressure and chirality and that the graphitic encapsulation of catalyst particles terminates SWCNT growth. These findings make it possible to clarify the chirality-sensitive growth behavior of SWCNTs.

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