

# Bulk ACCVD Generation of SWNTs with Narrow Chirality Distribution

○Shigeo Maruyama<sup>1)</sup>, Yuhei Miyauchi<sup>1)</sup>, Takashi Shimada<sup>1)</sup>, Yoichi Murakami<sup>1)</sup>,  
Kenichi Sato<sup>2)</sup>, Yuji Ozeki<sup>3)</sup> and Masahito Yoshikawa<sup>2)</sup>

1) Department of Mechanical Engineering, The University of Tokyo  
7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8656, Japan

2) Specialty Chemicals Research Lab., Chemical Research Labs., Toray Industries, Inc.  
9-1, Oe-cho, Minato-ku, Nagoya 455-8502, Japan

3) R&D Planning Dept., Technology Center, Toray Industries, Inc.  
1-1, Sonoyama 1-chome, Otsu, Shiga 520-8558, Japan

By scaling up the alcohol CCVD (ACCVD) generation technique [1,2] of single-walled carbon nanotubes (SWNTs), bulk amount of sample is being prepared. By dissolving zeolite used as catalysts support, purified SWNTs as shown in Fig. 1 are produced.

In order to determine the chirality distribution of SWNTs, dispersed and centrifuged SWNTs in NaDDBS/D<sub>2</sub>O was examined by the fluorescence spectroscopy with scanning excitation energy [3] as in Fig. 2. 'As-grown' sample (20 mg) was sonicated for 30 min in 10g of D<sub>2</sub>O with 0.5 wt % NaDDBS. After centrifuged at 436,000g × 1 hour, supernatants was used for the measurements. Narrow chirality distribution with bright (7,5) nanotube was obtained. This chirality distribution is equivalent to the case with CVD temperature at about 700 °C in the standard ACCVD method [4]. This sample with bright emission and with relatively narrow chirality distribution is useful for spectroscopic studies.

## References:

- [1] S. Maruyama et al., Chem. Phys. Lett., 360 (2002) 229.
- [2] Y. Murakami et al., Chem. Phys. Lett., 374 (2003) 53.
- [3] S.M. Bachilo et al., Science 298 (2002) 2361.
- [4] Y. Miyauchi et al., Chem. Phys. Lett., 387 (2004) 198.

Corresponding Author: Shigeo Maruyama  
E-mail: maruyama@photon.t.u-tokyo.ac.jp  
Tel & Fax: +81-3-5800-6983



Fig. 1 Ten grams of purified SWNTs.

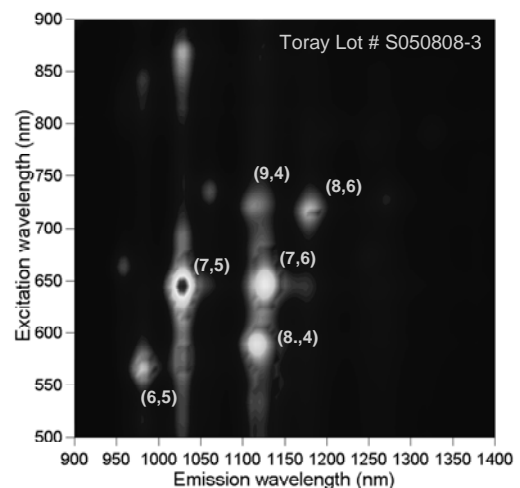


Fig. 2 Chirality distribution of SWNTs measured by fluorescence spectroscopy.