工学系研究科専攻間横断型教育プログラム
「機械システム・イノベーション」

GMSI

最先端融合科学イノベーション
教育研究コンソーシアム

東京大学 THE UNIVERSITY OF TOKYO

CIAiS

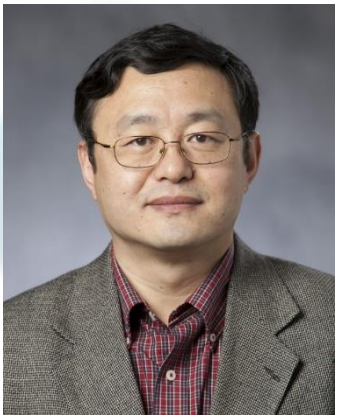
第217回GMSI公開セミナー／第41回CIAiSセミナー

Selective Growth of Semiconducting Single-walled Carbon Nanotubes

Professor Jie Liu

Department of Chemistry, Duke University

日 時: 12月27日(火) 14:00-15:30
場 所: 東京大学工学部2号館 3F 31A会議室



Even though the devices made from individual nanotubes have shown outstanding performances such as high mobility, high current, high thermal conductivity, good chemical and mechanical stability, the high hope for the next generation of carbon nanotube based electronics is hampered by several major problems. Among them, is the lack of reliable methods to control the alignment and position of nanotubes as well as, and perhaps most problematically, the growth of nanotubes with controlled chiralities. Even though the post-growth separation of metallic from semiconducting SWNTs have made very good progress, the alignment and assembly of the separated nanotubes into devices are still challenging and not suitable for large scale fabrication.

Consequently, a method that can directly produce well aligned arrays of pure semiconducting nanotubes is thought to be the ideal choice for large scale fabrication of nanotubes FETs. In recent years, through systematic studies, we proposed and confirmed a mechanism on the selective growth of semiconducting carbon nanotubes. Important rules were summarized for achieving a high selectivity in growing semiconducting nanotubes by systematically investigating the relationship among water concentration, carbon feeding rate, diameter of catalyst and the percentage of semiconducting nanotubes in the produced SWNT arrays. This understanding will help us to develop better approach to solve the most difficult problem which limited applications of carbon nanotubes in nanoelectronics – the coexistence of metallic and semiconducting nanotubes in samples produced by most, if not all, growth methods.

主催: 東京大学大学院工学系研究科「機械システム・イノベーション」プログラム（GMSI）
「最先端融合科学イノベーション教育研究コンソーシアム」(CIAiS)

本件連絡先: 東京大学大学院工学系研究科機械工学専攻 教授 丸山 茂夫
GMSIプログラム事務局 E-mail: office@gmsi.t.u-tokyo.ac.jp Phone: 03-5841-0696