SEMINAR SERIES

International Institute for Carbon-Neutral Energy Research
Kyushu University

Title Inorganic Nanoparticles as Innovative Energy Materials

Speaker Prof. Toshiharu TERANISHI

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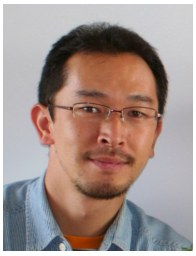

Date & Time Friday, February 8, 2013 4:00 p.m.

Place I²CNER Hall, Ito campus, Kyushu University

Abstract

Inorganic nanoparticles, such as metal and semiconductor nanoparticles, are of great importance in light of innovative energy materials (energy saving, storing, and creating materials) in the next generation. The structure of a nanoparticle is an important parameter that determines its individual characteristics and the suprastructures that it can form through assembly. First, the precise structural control (size: 1~300 nm, shape: spherical, polyhedral, disk, rod, etc.) of metal, metal chalcogenide, and metal oxide nanoparticles in the liquid phase will be presented. Then, a talk on their applications to energy-saving nanodevices and photoenergy conversion systems will be given on the basis of their structure-specific electronic, magnetic, optical, and catalytic properties. Especially, the following two topics will be reported in detail: one is the fabrication of single electron transistors using 1-2 nm gold nanoparticles capped by thin π-conjugated organic layers as Coulomb islands, where the interface between the organic and inorganic materials plays an important role. The other is concerning the plasmonics, which enable us to drastically enhance the photoexcitation efficiency in the ultraviolet to near infrared region by controlling the size, shape, and carrier density of conductive and semiconductive nanoparticles.

About the Speaker

Professor Toshiharu Teranishi was born in 1966 in Ishikawa. He received his PhD from The University of Tokyo under the direction of Professor Naoki Toshima in 1994. He spent seven and a half years at Japan Advanced Institute of Science and Technology as an Assistant Professor and an Associate Professor. He moved to University of Tsukuba as a Full Professor in 2004 and to Kyoto University in 2011. He is an executive board member of Society of Nano Science and Technology. Current research interests include precise structural control of inorganic nanomaterials and structure-specific functions for high-performance devices and photo-energy conversion.

Host: Associate Professor Miho YAMAUCHI

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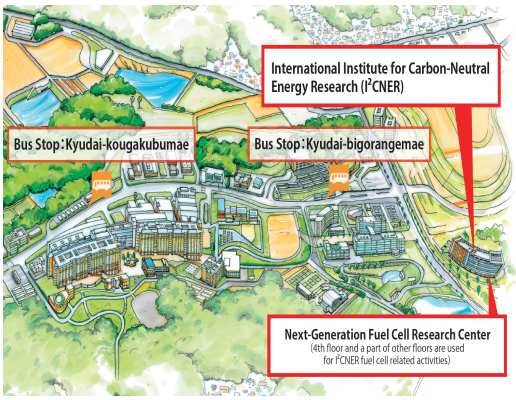

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