>>> ANNOUNCEMENT

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Electrospun Nanofibers for Energy and Environmental Applications

ABSTRACT

Rapid advances in nanotechnology have provided a large variety of nanomaterials with various shapes and superior properties during the past two decades. One-dimensional (1-D) nanostructures such as nanofibers, nanowires, and nanotubes have unique properties compared to their bulk solids (e.g., large specific surface area, high conductivity, and direct path for charge transport). Electrospinning is a versatile method for forming continuous thin fibers based on an electrohydrodynamic process. The advantages of electrospinning are (i) forming nano-micro-scaled fibers and (ii) the one-step forming of nanofiber networks. Electrospun nanofiber networks with high surface areas have drawn significant attention for their practical applications, such as high-performance filter media, battery separator and electrode.

This presentation provides our recent research works on the fabrication of nanofibers or nanofiber networks composed of carbon and carbon composite, organic and inorganic semiconductors, and metal by electrospinning and their applications for energy and environmental uses. For example, the introduction of organic or inorganic semiconductor nanofiber networks into the bulk-heterojunction layer of organic solar cells increased the short-circuit current (Jsc), due to the formation of continuous carrier path. We have also demonstrated that transparent and conductive alminum (Al) nanowire networks can be fabricated by the wet chemical etching of an Al thin layer deposited on a poly(ethylene terephthalate) film, with an electrospun polymer nanofiber mask. The details of these applications will be reported in my presentation.

BIO

Since 2002	Associate Professor, Department of Organic and Polymeric Materials, Tokyo Institute of Technology, Tokyo, Japan
2002	Dr. of Engineering Science, Tokyo Institute of Technology, Tokyo, Japan

Research Interests: Physical Chemistry of Organic Materials, Polymeric and Fibrous Materials and Nanomaterials for Energy Conversion and Storage

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Leibniz Institute of Polymer Research, Max Bergmann Center of Biomaterials Dresden
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