

## Mesoporous TiO<sub>2</sub> Particle for Dye Sensitized Solar Cell

Sung Soo Kim, Myung Sil Kim, Min Suk Kang, and Ji Man Kim\*

Department of Chemistry, BK21 School of Chemical Materials Science and SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University, Suwon, 440-746, Korea

Solar cells on dye-sensitization of TiO<sub>2</sub> electrode are regarded as a regenerative low-cost alternative to conventional solid-state devices. Various forms of nanocrystalline TiO<sub>2</sub> have been extensively investigated as a potential material for dye-sensitized solar cells (DSSCs). In addition to this, a great deal of attention has been focused on developing novel sensitizers, electrolytes, and semiconductor electrode materials.

For the DSSCs, the TiO<sub>2</sub> materials should have high surface areas so that the dye molecules can be sufficiently adsorbed, resulting in the generation of a high photocurrent. In this study, mesoporous TiO<sub>2</sub> was synthesized by a nanocasting method using mesoporous silica as the template. The mesoporous TiO<sub>2</sub> has not only a high surface area (about 220m<sup>2</sup>/g), but also uniform nanochannels that can be easily accessed by the electrolyte for I<sub>3</sub><sup>-</sup> ion transport. In the present work, we describe the synthesis of the mesoporous TiO<sub>2</sub> materials and utilization of the materials for an electrode material in DSSCs.