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Key Words Inorganic Chemistry, Nano Materials, Carbon Capture, Fuel Cell Catalyst

Research Area

My research interests on materials issues related with environment and energy. Currently, my group is focusing on two separate projects. In one of them, we are trying to develop CO_2 absorbents that can be used repetitively in the temperature range of 300-500°C. Such a material is considered to be an integral part for the development of a carbon capture process which may become a major workhorse in reducing the emission of CO_2 and, hence, in addressing the issue of global warming. In the other project, we are trying to understand and utilize sonochemistry in obtaining novel nanomaterials. Especially, we have developed a new reaction scheme to synthesize coreshell nanoparticles with Pt in the shell and various metals in the core, which features are highly sought for in many application fields including catalysis for fuel cells.

Education

- 1991 PhD Iowa State University, Ames
- 1987 MSc Iowa State University, Ames
- 1984 BSc Seoul National University, Korea

Experience

- 2008 Mar – 2009 Feb Visiting Professor, University of Namur, Belgium
- 1999 Sep – 2000 Aug Visiting Professor, University of California, Santa Barbara, USA
- 1992 Sep – Present Professor, Department of Chemistry, Sungkyunkwan University
- 1992 Feb – 1992 July Postdoctoral Member of Technical Staff, AT&T Bell Laboratories, USA

Position

- 2014 Jan – Present Dean, College of Science
- 2010 Oct –Present Managing Editor, NANO (SCIE Journal)

Publication

- "Multi-component electrocatalyst for low-temperature fuel cells synthesized via sonochemical reactions", Ultrasonics Sonochemistry 2016, 29, 401.
- "Rational Syntheses of Core-Shell Fe@(PtRu) Nanoparticle Electrocatalysts for Methanol Oxidation Reaction with Complete Suppression of CO-Poisoning and Highly Enhanced Activity", Journal of Materials Chemistry A 2015, 3, 17154
- "PdM Nanoparticles (M = Ni, Co, Fe, Mn) with High Activity and Stability in Formic Acid Oxidation Synthesized by Sonochemical Reactions", Journal of Power Sources 2014, 262, 35(
- "Synthesis of a CdSe-graphene hybrid composed of CdSe quantum dot arrays directly grown on CVD-graphene and its ultrafast carrier dynamics", Nanoscale, 2013, 5, 1483
- "Rational syntheses of core-shell Fex@Pt nanoparticles for the study of electrocatalytic oxygen reduction reaction", SCI. REP. 2013, 3, 2872.
- "Electrochemical Synthesis of CdSe Quantum-Dot Arrays on a Graphene Basal Plane Using Mesoporous Silica Thin-Film Templates", Advanced Materials, 2010, 22, 515