Joint seminar by
Department of Biomedical Sciences, School of Energy and Environment
& State Key Laboratory of Marine Pollution

CityU 香港城市大學 City University of Hong Kong
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"COPPWARE® Nano-Copper-Carbon Composite and Its Applications"

Prof. Kun Lian
Taiyuan University of Technology and
Xi'an Jiaotong University

Date : 10 December 2018
Time: 11:00am to 12:30pm
Venue: Meeting Room 2-130, 1/F, Block 2, To Yuen Building

Abstract

Biological systems found in nature provide excellent examples of highly controlled and organized architectures that generate complex materials. Using these materials and their unique microstructures as templates to produce nano-structured materials can result in some special results that manmade templates can rarely/can't achieve at current time. This presentation will introduce an innovative technology to produce the copper-carbon-core-shell nanoparticles (COPPWARE®) using cellulose as templates. COPPWARE® possesses many special properties that commercially available copper nanoparticles couldn't have. COPPWARE® have high physical/chemical stabilities and form the $Cu<=>Cu_2O$ equilibrium system without forming cupric oxide, which is significant since cuprous oxide is an optical catalyst material with relatively low bandgap (2.137eV). The most unique property is the regeneration behavior of COPPWARE®, when treated with reducing environment, the $Cu<=>Cu_2O$ system will return to pure copper status with no significant changes in particle size distribution or core-shell structure. Because of the excellent stability, superior performance and low cost, COPPWARE® have been tested as antimicrobial; antiviral; anti-termite; anti-algae and as an optical catalyst for volatile organic compounds (VOC) treatment reagents. Beside the aforementioned results, Professor Kun Lian's group also try to use COPPWARE® as a much green and harmless reagent to substitute the preservatives for animal feed, the antibiotics to control animal and fish diseases, the preliminary results will be shared also.

Biography

Dr. Kun Lian, obtained his B.S. in Engineering in 1982 from South China University of Technology in China, followed by M.S. and Ph.D. in Material Science and Engineering from Louisiana State University, in 1992 and 1995 respectively. Dr. Lian worked as Postdoctoral Research Follower at University Michigan at Ann Arbor after receiving his Ph.D. from 1997, Dr. Kun Lian joined Center for Advanced Microstructures and Devices, Louisiana State University, joint-position at Southern University, as Assistant Professor, Associate Professor and Professor. In 2012, Dr. Lian joined School of Nano-Science and Nano-Engineering, Suzhou, Xi'an Jiaotong University as Professor and Deputy Dean until now.

Dr. Lian's research activities have been focused on using biomass as template to synthesize metal nanomaterials and their applications. Material characterization, material processing techniques for Micro/Nano Electro-Mechanical-Systems (MEMS & NEMS), MEMS/NEMS based sensor systems, Dr. Lian's research activities have been supported by NSF, DOE, DARPA, USDA, NCHRP, and NASA, etc.

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All are welcome!