SPSJ Kyushu Branch Seminar
Global COE Seminar No.63

Manipulation of Nanoparticle Dispersion and Assembly

Prof. H.-J. Sue
Texas A&M University

November 28 (Friday), 16:00-17:00

Seminar Room, CE40 2F, Kyushu University, Ito Campus

Free admission

Dr. H.-J. Sue is a Full Professor and teaches at the Department of Mechanical Engineering, Texas A&M University (TAMU), since 1995. He received his Bachelor's degree from the Chung-Yuan Christian University, Taiwan, in 1981. He then obtained his Masters' and Ph.D. degrees from the University of Michigan in 1985, 1987, and 1988, respectively. Before joining TAMU, Dr. Sue was employed by Dow Chemical at Freeport, TX, for about seven years. He has focused most of his research work on fundamental understanding of structure-property relationship of polymeric materials. His recent research interests include micro- and nano-scratch behavior of polymers and preparation of polymer nanocomposites for nanotechnology applications. Dr. Sue is currently the Director of the Polymer Technology Center at TAMU.

Abstract
Nanoscaled materials generally possess superior physical and mechanical properties over their bulk counterparts. For instance, when the size of semiconductor particles is reduced to a few nanometers, they exhibit enhanced quantum size-/shape-dependent optical and electronic properties, which greatly broaden their potential applications. Furthermore, when exfoliated, nanomaterials have extremely high surface-to-volume ratio, resulting in greatly improved barrier properties, mechanical properties, energy conversion efficiency, etc. However, the above attractive nanoscaled properties will become significantly suppressed if uncontrolled nanoparticle aggregation takes place. Thus, ability to exfoliate nanoparticles in a medium of interest is a critical step for realization of nanotechnologies for large-scale commercial applications. In this presentation, successful exfoliation of three types of nanomaterials is demonstrated: 1) 2-dimensional (2-D) α-zirconium phosphate (ZrP) nanoplatelets, 2) 1-dimensional (1-D) carbon nanotubes (CNTs), and 3) 0-dimensional (0-D) ZnO quantum dots (QDs). Colloidal dispersion of these nanomaterials and their subsequent self-assembly in solutions and in polymers are described. The significance of the present findings is also discussed.

連絡先
先導物質化学研究所(IMCE)
高原　淳　(Atsushi Takahara)
takahara@cstf.kyushu-u.ac.jp

主催：高分子学会九州支部、九州大学グローバルＣＯＥ「未来分子システム科学」、高分子機能創造 RC