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## ADVANCED MATERIALS AND NANOTECHNOLOGY

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**Fabrication and characteristics of carbon nanotube based field-responsive composite materials**

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Carbon Nanotubes (CNTs) have received great attentions with their extraordinarily fascinating behaviors such as structural, mechanical, optical and electrical properties. They can be added into various polymers as fillers to prepare advanced functional polymeric composites. However, due to their intrinsically poor dispersibility, achieving a uniform dispersion is generally difficult. As one of the effective methods, milling processes are introduced to reduce the original size of the nanotubes to improve dispersion, especially in the case of CNT suspension rheology for potential battery applications. With interesting functionalities under external fields implying typical flow fields of laminar flow with most cases of rheological aspects and electrical and magnetic fields, electro-responsive Electro-Rheological (ER) characteristics of polymer/CNT composite systems from material rheological viewpoint are examined for various CNT composite particles with polystyrene and PMMA. Interesting characteristics of their ER suspensions include yield stress, flow curve behavior and dielectric analysis. As for Magneto-Responsive Magneto-Rheological (MR) materials, we coated the surface of soft-magnetic carbonyl iron particles with CNT along with polymers to produce their favorable core-shell structure with apparently decreased particle density for better dispersion and then characterized their MR characteristics under magnetic fields applied.

**Biography**

Hyoung Jin Choi is a Fellow Professor at Inha University, Republic of Korea and has completed his BS from Seoul National University and PhD in Chemical Engineering from Carnegie Mellon University. His research interests cover soft matter materials and complex fluids including electro-rheology, magneto-rheology and polymer rheology. He is a Member of Korean Academy of Science and Technology and a recipient of numerous scientific achievement awards including World Class Research Front Award and Thomson Scientific Citation Laureate 2007 and the 2016 Top 300 Most Cited Researchers in *Materials Science and Engineering* by Elsevier Scopus Data.

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