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Fabrication and applications of carbon nanomaterials filled multi-functional nanocomposites

Carbon nanomaterials, such as Carbon Nanotube (CNT) and graphene, are promising fillers for nanocomposite materials due to their excellent mechanical and functional properties. Previous researches on carbon nanomaterials filled nanocomposites have shown limited enhancement of properties due to strong agglomeration of the carbon nano-materials and poor interfacial bonding between the carbon nanomaterials and matrices. In this presentation, a novel fabrication process, named as molecular-level mixing process, is introduced to fabricate carbon nanomaterials filled nanocomposites in order to maximize the effect of filler addition in various matrices. The molecular level mixing process has been proved to realize homogeneous dispersion of nanomaterials with strong interfacial bonding with matrices. Various types of carbon nanomaterials filled nanocomposites with remarkably enhanced mechanical, electrical and electro-chemical properties show a wide scope of possible applications such as strong and tough structural materials, EMI shielding materials, flexible and stretchable conductors, electrodes for energy storage devices and organic photovoltaic cells, etc.

Biography

Soon Hyung Hong has completed his PhD in department of materials science and engineering at Northwestern University. After having R&D experience at Stanford University as a Research Associate, he joined Korea Advanced Institute of Science and Technology (KAIST) as a Professor, Directing Research and education on nanomaterials and nanocomposites. He pioneered to develop frontier technologies for fabrication processes and applications of multi-functional nanocomposites and served as the President of the Korea Society for Composite Materials (KSCM) and the Director for Basic Science and Engineering at National Research Foundation (NRF). He has published 242 international journal papers and registered 146 patents mainly in areas of nanomaterials and nanocomposites.

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