Editorial

In recent years, the research and development has been greatly advanced. Materials made with nanoscale components add new functional and structural properties forming nanocomposites and opening many applications. Such nanocomposites are of great importance for a multitude of industrial uses and attract much research interests. This special issue, entitled “Functional Nanocomposite Materials” is a collection of twelve papers and the contributors are from the Chinese University of Hong Kong, the Hong Kong University of Science and Technology, Tsinghua University, University of Science and Technology Beijing, Chinese Academy of Sciences Shenzhen Institute of Advanced Technology, Shenzhen Academy of Aerospace Technology, King Abdullah University of Science and Technology, and Georgia Institute of Technology. From these papers, the readers may see the new research results in nanocomposite materials, as well as sense the quality of the work especially in the region of east Asia.

Among the twelve papers, four are related to energy storage, in particular the cathode of the lithium-ion battery, Zn anode in neutral electrolyte and electrode material for supercapacitor. The paper, entitled “Structure and Electrochemical Performance of Modificated $LiMn_2O_4$ by S-Co Codoping and Nano SiO_2 Surface Coating,” deals with a specific problem: improving the cycling performance at elevated temperatures of the $LiMn_2O_4$, which is used as the cathode of lithium-ion battery. The second paper, entitled “$LiFePO_4$ Carbon Nanocomposite Cathode Material for Lithium Ion Batteries,” proposes a new cathode material for lithium ion battery, in which the $LiFePO_4$ nanoparticles are formed in-situ in the porous carbon framework, exhibiting enhanced surface electronic conductivity and improved capacity retention. The paper, entitled “Effect of Nanocomposite Additives on Corrosion Inhibition of Zn Anode in Neutral Solution” presents useful results of inhibiting Zn anode corrosion by introducing a nanocomposite of hexadecyl trimethyl ammonium bromide (CTAB) / polyethylene glycol nanowire (NPEG) to the neutral electrolyte. The paper entitled “Ordered Macroporous Carbon/Polyaniline Nanocomposites as Electrode Materials for Supercapacitors” gives a receipt for making supercapacitors with high specific capacitance.

There are five papers related to the materials for electronics. The paper, entitled “Microstructure and Properties of Ferrite/organic Nnanocomposite Prepared with Microemulsion method” investigates a micro emulsion process to obtain a stable magnetic slurry containing organic compounds and nano ferrites suspension. The paper “Effects of Zinc Content on the Magnetic Properties of Ni-Zn Ferrite/Epoxy Composites” gives a receipt for making nanocomposite film inductors for the application in the functionalized printed circuit board. “The Electromagnetic Properties of Different Urchinlike Ni Nanostructures” discovers the relationship between the

morphology and the electromagnetic properties of Ni nanostructures, which can be used for microwave absorption. The paper entitled “Effects of Ambient Pressure on the Structural and Magnetic Properties of Bismuth Ferrite Nanoparticles Prepared by Pulsed Laser Deposition (PLD)” presents a guidance in obtaining a thin film composed of desired multiferroic nanoparticles. The paper entitled “Impedance Analysis on the Percolation Mechanism of the Nickel/Calcium Copper Titanate/Polyvinylidene Fluoride Composite,” investigates the occurrence mechanism of percolation in the dielectric performance by setting up an equivalent circuit for the three-phase conductor/ceramic/polymer composite system. It gives a receipt for making multifunctional microelectronic devices.

There are two papers working on the thermal properties of the nanocomposites. The paper, entitled “One-Pot Synthesis of Composite Nano-Capsules with Paraffin as Core and PMMA-SiO_2 as Shell by Interfacial Hydrolysis and Polymerization,” presents a method to make homogenous and stable nano-capsulate phase change material. The paper, entitled “Carbon Nanotube/Polymer Nanocomposites: Improved or Reduce Thermal Stabilities?” is interesting. It shows that not only the materials but also the processing condition is important in obtaining nanocomposite materials with high thermal stability.

Finally, the paper, entitled “Luminous Chitosan-dye Nanocomposite Pparticles with Enhanced Lifetime and Stability” relates to the biomedical field. The nanoparticular chitosan-dye nanocomposites demonstrate a much improved stability against UV and ozone attack. This material is non-toxic and can be used as target biolabels in various medical and biomedical applications.

During the editing process, we received a total of 15 papers. After vigours peer review, 12 papers are selected. We would like to acknowlege all the authors for their contributions, cooperation and quick response to the comments and queries raised by the reviewers. Appreciations are also delivered to all the referees for their time and effort. Last but not the least, the guest editors would like to thank Trans Tech Publications Ltd. for publishing this special volume.

To the reader, we hope these papers are useful.

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