



Magnetic/Optic Nanocomposites for Multipurpose Biomedical Applications

by Mr. Sheng Yang

Date: 22nd October 2009 (Thursday)

Time: 12:30pm to 1:00pm

Venue: EA-02-11 (Executive Seminar Room)

Abstract

Among various properties of nano-sized biomedical materials, magnetic and optical properties attract the most attention of researchers worldwide. These two properties enable materials broadly potential applications in imaging, gene or drug delivery and hyperthermal therapy, etc. While there is still great interest in studying single component material, researchers are also seeking to make multicomponent nanomaterials to combine multi functions into one single system. Here, a new multifunctional nanocomposite, composed of classic magnetic material Iron Oxide, optical material Gold, and silica, is synthesized. TEM pictures indicated that the overall size of these monodispersed composites was below 100 nm, which is critical for most in vivo application. The magnetic and optical properties are also characterized. The size of iron oxide is controlled within the critical value for superparamagnetism and the maxim moment is up to 60 emu/g. During the experiment, silica coating on iron oxide is introduced as a potential component for drug delivery. The magnetization moment can be compromised by silica coating to some extent; however, it still maintains several emu/g via tuning the thickness of the shell. In short, Fe₃O₄/Silica/Au nanocomposite is synthesized and improvements on both magnetic and optical response are under way.

Mr Sheng Yang Speaker

Mr. Sheng Yang obtained his Bachelor's degree in Materials Science and Engineering from Nanjing University of Aeronautics and Astronautics. He is now a PhD candidate in the Department of Materials Science and Engineering, National University of Singapore. His research interest focuses on composite nanomaterials for biomedical application and he is under the guidance of Dr Xue Jun Min.

Dr Xue Jun Min Host

All are Welcome!