

PhD Open Seminar

Speaker: Subhadip Ghosh (Supervisor: Dr. Saptarshi Mukherjee)
Seminar title: Luminescent Metal Nanoclusters and Nanoparticle: Synthesis, Spectroscopic Investigations and Applications
Date: October 15, 2015 (Thursday)
Time: 4:00 PM
Venue: AB-2 401

Abstract

The optical features associated with the noble metal nanoclusters (NCs) are quite fascinating which involves high photoluminescence, tunable emission, large Stokes shift, besides being biocompatible, water soluble and non-toxic in nature. Although several methods were successfully developed for the synthesis of luminescent NCs, yet there were drawbacks in terms of relatively lower values of quantum yield and photo-stability, and the formation of larger sized nanoparticles as a side product. Taking these factors into consideration, there was still a strong urge for several modifications and development in the synthesis and applications of luminescent noble metal nanomaterials. In my PhD work, I have tried to work on the refinements in the synthetic strategies of these luminescent NCs and subsequently unravel some of their unique as well as novel properties from application point-of-view. I have synthesized protein templated Silver and Copper NCs exhibiting stable and unique luminescent characteristics.¹⁻⁴ These materials were demonstrated as highly efficient probes for several sensitive applications like metal ion and temperature detection,^{2,3} enzyme mediated kinetics,⁴ single molecule studies and as energy transfer assays.^{3,4} Apart from NCs, I have developed a strategy to synthesize exclusive drug mediated fluorescent nanoparticles which were characterized as effective pharmaceutical tools.⁵ In this seminar, I will discuss in details the facile and cost effective synthetic protocols we have adopted for these nanomaterials, their spectroscopic characterization and most importantly the mystery underlying their luminescent properties and finally their various interdisciplinary applications.

References

1. Anand, U.; Ghosh, S.; Mukherjee, S. *J. Phys. Chem. Lett.* **2012**, *3*, 3605-3609.

2. Ghosh, S.; Anand, U.; Mukherjee, S. *Anal. Chem.* **2014**, *86*, 3188-3194.
3. Ghosh, S.; Das, N. K.; Anand, U.; Mukherjee, S. *J. Phys. Chem. Lett.* **2015**, *6*, 1293-1298.
4. Ghosh, S.; Anand, U.; Mukherjee, S. *J. Phys. Chem. C* **2015**, *119*, 10776-10784.
5. Ghosh, S.; Anand, U.; Mukherjee, S. *Analyst.* **2013**, *138*, 4270-4274.