

# The Society for Polymer Science, India - Mumbai Chapter

Webinar On

Surface Functionalization of Nanoparticles  
for their compatibilization with different solvent media/polymer  
matrices



23 January, 2021



03:00 pm to 04:30 pm



**Dr. B. L. V. Prasad**

Physical/Materials Chemistry Division,  
National Chemical Laboratory  
(CSIR-NCL), Pune

Sharing of Perspectives:

**Dr. Anuya Nisal**

Principal Scientist,  
Cofounder – Serigen Mediproducs Pvt. Ltd.  
National Chemical Laboratory, Pune

Hosted by:

Department of Polymer Science, S K Somaiya College

Register on: <https://forms.gle/NMwNfg27S4U6DGL77>

Mail: [spsi.bombay@gmail.com](mailto:spsi.bombay@gmail.com) | Contact: +91 98691 69824 / 94509 38773

## B. L. V. Prasad

Working as a Senior Principle Scientist in the Physical/Materials Chemistry Division of National Chemical Laboratory (CSIR-NCL), Pune, Bhagavatula L. V. Prasad is a Master of Science and Ph.D. Degree holder in Chemistry. After two post-doctoral stints; one at Tokyo Institute of Technology (2 years JSPS fellowship and 1 year Research Associateship) and second at Kansas State University (KSU; 2.5 years -NASA sponsored project); he joined NCL in 2003 and continuing there at present. His group is actively working in the general area of material synthesis and in particular nanoparticles and nanoscale materials. He has published more than 125 papers in international peer reviewed journals and has 8 international patents to his credit. He was invited as visiting professor by different universities in many countries, including Japan, USA, UK, France and Germany. 18 students have completed PhD under his supervision and another 6 are pursuing their PhD currently.

His major awards and recognitions include:

- Selection for CNR Rao National Prize for Chemical Research by CRSI (2020)
- MRSI-ICSC Materials Science Annual Prize for 2020
- Elected as Fellow of the Andhra Pradesh Academy of Sciences, 2017
- Admitted as Fellow of Royal Society of Chemistry (FRSC), London, 2016
- Elected as Fellow of the Indian Academy of Sciences, Bangalore, 2014
- Young Career Award-DST Nanomission, 2013
- Chemical Research Society of India, Bronze Medal, 2013
- CSIR-RAMAN Fellowship 2012
- Materials Research Society of India Medal 2012
- Scientist of the Year, NCL Research Foundation January 2009
- NASA Sponsored Project Research Associateship, Kansas State University 2000-2003
- JSPS (Japan) Post-Doctoral Fellowship, 1997-2000

# Abstract of The Talk

The compatibility of the nanoparticles with different solvent media or polymeric matrices is crucially governed by the type of capping agent used. For example, water dispersibility is an essential criterion to realize several bio-applications of nanoparticles. Apart from the traditional protocols involving charge imparting reducing/ stabilizing agents, many reducing agents in combination with water dispersible polymers, surfactants and capping agents have been used to accomplish this important stipulation. In this context we have been working on developing various methods to prepare stable and water dispersible metal nanoparticles like Au, Ag and magnetic Co and Ni. Such water dispersible nanoparticles play an important role in the surface modification of polymeric scaffolds and bio-implants to make the latter suitable for various tissue engineering applications. Though scaffolds, implants made of plastic/polymeric materials are widely being used in tissue engineering applications because of their excellent material properties and bio-inactive nature their slow integration with live tissues poses a great challenge. Surface modification leading to certain superficial changes while retaining the strength and durability of the scaffolds, is suggested as a solution to this problem. Unfortunately, carrying out surface modification is cumbersome in some cases while in case of others, the surface modifications are of transient nature. It is in this context that the above mentioned water dispersible nanoparticles play a crucial role. For instance, we have been working on a simple and convenient strategy by which the surface characteristics of the polymeric scaffolds could be changed without compromising the bulk material properties. This strategy (termed P-LbL) involves the plasma treatment of the scaffold followed by layer-by-layer assembly of citrate stabilized AuNP coating on the plasma treated scaffold. This P-LbL strategy turned out to be an expedient tool for the surface modification of hydrophobic polymers. We found that P-LbL method allows the attachment of a wide variety of molecules to the surface of hydrophobic polymer so that they become suitable for different tissue engineering applications.

## The Society for Polymer Science, India (SPSI)

The Society for Polymer Science, India (Estd. in 1979) promotes advancement of Science, Technology and Education in the broader areas of Polymers and related fields in the country. The Society provides a forum for exchange of information, knowledge and skills among academics, researchers, students, practitioners, institutions, and industries engaged in teaching, research, product development and commercialisation of the different kinds of polymeric materials, natural and synthetic. The Society functions through its Head Quarters at Pune and the 9 regional Chapters, at Bangalore, Calicut, Chennai, Delhi, Kharagpur, Kolkata, Pune, Mumbai and Thiruvananthapuram. SPSI takes up different activities in pursuit of excellence in the field of polymer science, engineering and technology. These include conduct of seminars, discussion meetings, regional, national and international conferences, Endowment Lectures, recognition of contributions of great polymer scientists by way of instituting Awards and Prizes, and supporting education and training in academic institutions involved in the areas of polymer science and technology.



# Somaiya Vidyavihar University

With over six decades of rich experience in building and managing educational institutes of great repute, Somaiya Vidyavihar, located in the Vidyavihar Campus, Mumbai, has become a Private University in 2019, bringing all of its self-financing higher education institutions and the self-financing programmes at the undergraduate and post-graduate level under one umbrella. The University was enacted by an Act of the Maharashtra State Legislature, and approved by the University Grants Commission, Government of India.

It is a comprehensive Multi-Faculty University with the Faculties/Institutes/Centres of Management, Engineering and Technology, Dharma Studies, Commerce and Business Studies, Humanities, Arts, Social Sciences, Education, Science and Technology, Languages and Literature, Journalism & Mass communication Sports & Physical Education and Visual & Performing Arts.

In addition to UG, PG and Ph.D. Programmes, the University offers a wide range of options to students for certificate, diploma, minor and major in industrially and socially relevant subjects of studies and training. The University has 27 recognised departments/centres for Ph.D. research and about 100 recognised research supervisors under the various Faculties, coordinated by the R & D division of Somaiya Vidyavihar and the Somaiya Institute of Research and Consultancy.



# M.Sc Polymer Science

Department of Polymer Science, S K Somaiya College, a constituent college of Somaiya Vidyavihar University, offers an Academia-Industry Joint-Taught PG Program in Polymer Science.

## Unique Feature and Highlights of the Course



Multifaceted post-graduate teaching, training and research capacity building course in one of the central industrial growth sectors.



Joint Academia-Industry Taught programme with 3 semesters in the College and 1 semester in the Industry and R & D



Taught by renowned, experienced teachers/scientists (from College/ Universities/Industrial and Public and Corporate R&D Institutes) with Doctoral and Post-doctoral qualifications.



Multidisciplinary collaboration among chemists, physicists and engineers who are seeking new knowledge on design, synthesis, characterisation, processing and understanding the molecular basis of novel functional materials.



This research-oriented course offers polymer chemistry, polymer physics and polymer engineering topics specialisation.



Equips the candidates for work in industry and provides advanced training for research at the Ph.D. level



Mail: [spsi.bombay@gmail.com](mailto:spsi.bombay@gmail.com)



Contact: 9869169824 / 9450938773

