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Technical Workshops Series – 2014

One-Day Intensive Workshop on
Particle Size Analysis & Colloidal Stability using DLS: Nano to Micro
Wave 2
 - Organized by SPIRIT, NCL & Venture Center -

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| Learn | Principles of Dynamic Light Scattering (DLS). Theory of scattering and detection. Understanding the instrumentation including various sampling techniques and detectors. Theory of Zeta potential and colloid stability. Applications of DLS in particle size analysis and in molecular weight determination. Application of zeta potential in observing behavior of dispersive systems and characterization of electrical double layer on solid/liquid interfaces. Best practices in particle size analysis. Live demonstration of experiments; Mini-workshop on data interpretation with real data; Quick update on latest techniques/developments; Workshop is intended to be basic. |
| Organized by | <ul style="list-style-type: none"> • Venture Center – a Technology Business Incubator |
| For whom | <ul style="list-style-type: none"> • Industry professionals wishing to expand their skill sets (Industries – Pharma; Paints; Cement; Polymers; FMCG etc) • Students and staff of polymer/ materials sciences/ engineering/ analytical/physical chemistry wishing to equip themselves for industry jobs • Maximum 20 seats; First-come-first-serve. |
| Anchor Faculty | Dr. Suresh Bhat, Scientist, National Chemical Laboratory |
| VC Organization team | Sujaya Ingale, Edna Joseph , Pratima Jagtap |
| When | Saturday, 13th September 2014, 9 am – 5:45 pm |
| Where | Training Room, Venture Center, 100 NCL Innovation Park, Dr. Homi Bhabha (Pashan) Road, Pune-411008 |
| Contact | Ms. Lipika Biswas Venture Center, 100, NCL Innovation Park, Dr. Homi Bhabha Road, Pune – 411008; Phone: +91-20-2586-5877; Email: eventsdesk@venturecenter.co.in |
| Cost | <ul style="list-style-type: none"> • Micro and small enterprises/ individuals: Rs. 2,000/- • Medium and large companies/ others: Rs. 4,000/- • Students with valid ID card: Rs. 900/- |



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Introduction



Particle Size is an important physical property of particulate samples and particle size measurement is a commonly used technique in a wide range of industries including **pharma, paint, cement, polymer, drug** etc. Knowing and controlling the particle size is very important for product development, processing, manufacturing and quality control. Zeta potential is of critical importance in determining the stability of colloids.

This workshop aims to give an introduction to the principles and practice of Particle Size Analysis for industry professionals and students. The workshop will be conducted by an NCL scientist and Industry expert, both having vast experience working in Dynamic Light Scattering. The workshop includes lab demonstrations and data interpretation exercises. The workshop shall also discuss some recent trends and new developments in research and industry relating to **particle size analysis and stability of colloids**.

Course Outline

- Principles of Dynamic Light Scattering.
- Theory of scattering and detection.
- Understanding the instrument including various sampling techniques and detectors.
- Theory of Zeta potential and colloid stability.
- Applications of dynamic light scattering including particle size analysis, molecular weight determination.
- Applications of Zeta potential in dispersive systems and characterization of electrical double layer.
- Best practices in particle size analysis.
- Live demonstration of experiments and lab tour.
- Mini-workshop on data interpretation with real data.
- Quick update on latest techniques/developments.

| Time | Session title | Lead | Venue |
|----------------|---|--|----------------------------|
| 9:00 to 9:30 | Registration | | Foyer, Learning Center, VC |
| 9:30 to 9:45 | Introduction to the course and faculty | Dr. V Premnath | Training room, VC |
| 9:45 to 10:30 | Introduction and basic principles of DLS; General terms and parameters used in particle size analysis; Sample preparation techniques; Quick overview of particle size analysis; Typical data recorded. | Dr. Suresh Bhat | Training room, VC |
| 10:30 to 11:00 | Tea | | Foyer, Learning Center, VC |
| 11:00 to 11:45 | Introduction to Zeta potential; Applications | Mr. Manoj Bhataria | Training room, VC |
| 11:45 to 12:15 | Instrumentation; Types of Laser sources; Types of sampling cells and their compatibility with various solvents; Types of detectors | Mr. Manoj Bhataria | Training room, VC |
| 12:15 to 13:00 | Applications of DLS; Molecular weight determination, Interactive session – Real case studies and application notes. | Dr. Suresh Bhat Mr. Manoj Bhataria | Training room, VC |
| 13:00 to 14:00 | Lunch | | Cafeteria, VC |
| 14:00 to 14:30 | Best practices in particle size analysis. | Dr. Suresh Bhat | Training room, VC |
| 14:30 to 16:30 | Practical Session <ul style="list-style-type: none"> • Instrument parts • Sample preparation • Standard samples & Nanoparticle analysis • Pharmaceutical drug particle analysis • Data interpretation exercise • Calculations | Ms. Maya Viswanadhan Ms. Edna Joseph Mr. Manoj Bhataria Dr. Suresh Bhat | Lab block, VC |
| 16:30 to 17:00 | Tea | | Foyer, Learning Center, VC |
| 17:00 to 17:45 | Closure – Feedback, Certificate distribution | Dr. V Premnath | Training room, VC |

| Anchor Faculty | |
|--|---|
|  | <p>Dr. Suresh Bhat Scientist E1, Polymer Science and Engineering Department, National Chemical Laboratory, Pune.</p> <p>Dr. Bhat has extensive expertise in the field of Light scattering from complex fluids, Protein-Polysaccharide interactions, Aggregation, Gelation and phase separation in soft materials. His areas of interest are Investigation of Structure, Dynamics & Rheology of Soft Materials using Scattering Techniques, Structure Property Relationships, Application of Nanoscience concepts to food technology, Developments of novel scattering tools for soft matter research.</p> |
|  | <p>Mr. Manoj Bhataria Head - Advance Machines, Inventys Research Company Pvt. Ltd., Mumbai</p> <p>Mr. Manoj Bhataria founded Brookhaven Instruments India in 1996, which later transformed into the Particle Science group at the RGB Technologies Pvt. Ltd, Mumbai, now part of the Inventys Research Company Pvt Ltd. He has extensive experience in particle characterization (particle size, particle shape, zeta potential, molecular weight, etc) using Light Scattering as well as Sedimentation and Image Analysis. He has developed expertise in spray drying, spray pyrolysis, thin films, coatings, fuel cells, solar cells, etc. He is also an automation expert and developed new products for industrial and laboratory use.</p> |
| <p>Other Faculty</p> | <p>Dr V. Premnath is Scientist, Complex Fluids and Polymer Engineering Group at NCL, Pune, Head, NCL Innovations and Director, Venture Center. He specializes in Polymer Science and Engineering.</p> <p>Ms. Maya Viswanadhan is Research assistant with Dr. Suresh Bhat at NCL, Pune. She is currently working on Particle size analysis of industrial samples using light scattering techniques. She is also well versed with different spectroscopic and chromatographic techniques.</p> <p>Mrs. Sujaya Ingale and Ms. Edna Joseph shall organize and assist in lab demos.</p> |



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Course includes

- Course notes (hard copy) including slides, case studies, application notes
- Lab demo and tour to see Particle Size Analyzer with zeta potential attachment
- Access to restricted website with online compilation of resources for Particle size Analysis
- One-on-one feedback on data interpretation exercise
- Certificate of Participation issued by Venture Center
- Course includes tea and lunch at Venture Center cafeteria

About the organizers

About Venture Center

Entrepreneurship Development Center (Venture Center) – a CSIR initiative – is a Section 25 company hosted by the National Chemical Laboratory, Pune. Venture Center strives to nucleate and nurture technology and knowledge-based enterprises by leveraging the scientific and engineering competencies of the institutions in the Pune region in India. The Venture Center is a technology business incubator supported by the Department of Science & Technology's National Science & Technology Entrepreneurship Development Board (DST-NSTEDB). Venture Center's focuses on technology enterprises offering products and services exploiting scientific expertise in the areas of materials, chemicals and biological sciences & engineering. For more information, visit <http://www.venturecenter.co.in/>

About SPIRIT at National Chemical Laboratory, Pune

SPIRIT stands for Sustainable Polymer Industry through Research, Innovation and Training. SPIRIT is a Centre of Excellence in Polymers sponsored by the Department of Chemicals and Petrochemicals, Government of India, at the CSIR-National Chemical Laboratory, Pune. More information: <http://www.pamlab.org/spirit/>