



Technical Workshops Series – 2019

**One Day Workshop on  
Thermal Analysis – DSC, TGA & DMA  
(Emphasis on Polymeric Materials)  
- Organized by NCL & Venture Center -**

<b>Learn</b>	Principles of thermal analysis; Types of thermal analysis – DSC, TGA & DMA; Applications of thermal analysis (transition temperatures, melting temperatures, crystallization temperatures, degradation temperatures, composition of mixtures/ blends/ composites); Live demonstration of experiments on latest instruments; Best practices in thermal analysis; Mini-workshop on data interpretation with hands-on experience; Quick update on latest techniques/developments as well as hyphenated techniques like TGA-FTIR etc.; Workshop will emphasize polymeric materials.								
<b>Organized by</b>	<ul style="list-style-type: none"> <li>• Venture Center – a Technology Business Incubator</li> <li>• CSIR- National Chemical Laboratory</li> </ul>								
<b>For whom</b>	<ul style="list-style-type: none"> <li>• Industry professionals wishing to expand their skill sets.</li> <li>• Students and staff of polymer/ materials sciences/ engineering/ analytical/physical chemistry wishing to equip themselves for industry jobs</li> </ul>								
<b>When</b>	<b>(Wednesday) 7 August 2019   Time: 0900-1730</b>								
<b>Where</b>	<b>Classroom Sessions:</b> Training Room, Venture Center, 100 NCL Innovation Park, Dr. Homi Bhabha Road (Pashan), Pune-411008. <b>Lab Sessions:</b> Lab Block, Venture Center, Dr. Homi Bhabha Road (Pashan), Pune -411008								
<b>Contact</b>	<b>Technical queries:</b> Ms Madhulika   +91 7410045651   <a href="mailto:madhulika@venturecenter.co.in">madhulika@venturecenter.co.in</a> <b>Logistical queries:</b> Ms Lipika   020-25865877/75/76   <a href="mailto:eventsdesk@venturecenter.co.in">eventsdesk@venturecenter.co.in</a>								
<b>Cost</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Category</th> <th style="text-align: left;">Fees</th> </tr> </thead> <tbody> <tr> <td>Students with valid ID card</td> <td>Rs 1200/-</td> </tr> <tr> <td>Micro and Small Enterprises/ academic institutions/ Individuals</td> <td>Rs 2500/-</td> </tr> <tr> <td>Medium and large companies</td> <td>Rs 5000/-</td> </tr> </tbody> </table> <p><b>Limited seats: 20; First-come-first-serve</b></p> <p><b>Register here:</b> <a href="http://bit.ly/7aug19-TAws">http://bit.ly/7aug19-TAws</a>  <b>Registration closes once 20 seats are full or 1 August 2019 (whichever comes sooner)</b></p> <p>NOTE</p> <ul style="list-style-type: none"> <li>➤ Definitions of Micro Small and Medium Enterprise: <a href="http://dcmsme.gov.in/ssiindia/defination_msme.htm">http://dcmsme.gov.in/ssiindia/defination_msme.htm</a></li> <li>➤ <b>Fees paid is not refundable and non transferable under any circumstances</b></li> </ul>	Category	Fees	Students with valid ID card	Rs 1200/-	Micro and Small Enterprises/ academic institutions/ Individuals	Rs 2500/-	Medium and large companies	Rs 5000/-
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## Introduction

Thermal Analysis techniques are used in a wide range of disciplines, from pharmacy and foods to polymer science, materials and glasses. The wide range of measurements possible provide fundamental information on the material properties of the system under test, so thermal analysis has found increasing use both in basic characterization of materials and in a wide range of applications in research, development and quality control in industry and academia.

Thermal analysis is a very useful technique in various industrial research projects – in particular, for the polymer industry. Using TGA one can find the degradation temperature, filler percentage, thermal stability of polymer at desired temperature etc. And using DSC, easy and fast determination of glass transition temperature, melting and crystallization temperature, heat of crystallization, heat of fusion, very fast determination of purity, fast heat capacity measurement, characterization of thermosets and measurement of liquid crystal transitions. Kinetics evolution of chemical reactions such as cure, polymer crystallization is also possible. Dynamic Mechanical Analysis, otherwise known as DMA, is a technique where a small deformation is applied to a sample in a cyclic manner. This allows the materials response to stress, temperature, frequency and other values to be studied.

The workshop is designed with strong focus on practical aspects of thermal analysis techniques as getting correct data and interpreting it correctly is very important.

Participants will be benefited enormously by the treasure of knowledge and experiences of the expert in the field. The workshop will be interactive so that participants can go back and handle their equipments correctly and confidently.

## Course Outline

- Overview of thermal analysis techniques and applications (emphasis on polymers)
- Principle of operation of DSC, TGA & DMA
- Instrumentation of DSC, TGA & DMA
- Interactive session – Case studies and applications of DSC, TGA & DMA
- Practical session – sample preparation, setting up an experiment and run a sample
- Interpretation of results

## Course includes

- Course material including slides, case studies and application notes
- Access to restricted website with online compilation of resources for thermal 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

**\*Please note, the participants will have to arrange for their own travel/local transport and accommodation and dinners.**


- For accommodation (standard and budgeted hotels) please visit: [www.venturecenter.co.in/puneguide/standard.php](http://www.venturecenter.co.in/puneguide/standard.php)
- For accommodation (deluxe and luxury hotels) please visit: [www.venturecenter.co.in/puneguide/deluxe.php](http://www.venturecenter.co.in/puneguide/deluxe.php)  
For local transport details visit: [www.venturecenter.co.in/puneguide/taxi.php](http://www.venturecenter.co.in/puneguide/taxi.php)





### Workshop schedule

Time	Session title	Lead	Venue
9:00 to 9:30	Registration		Foyer Area
9:30 to 10:15	Introduction to the course and faculty	Dr V Premnath/ Manisha P	Training Room, VC
	Overview-Thermal analysis techniques and applications	Dr Neelima Bulakh	Training Room, VC
10:15 to 10:45	Tea		Foyer Area
10:45 to 13:15	Understanding the DSC,TGA & DMA instruments in detail; typical experiments and runs	Dr Neelima Bulakh	Training Room, VC
	Real case studies and application notes	Dr Neelima Bulakh	Training Room, VC
13:15 to 14:15	Lunch		Cafeteria, VC
14:15 to 16:00	Practical session – TGA & DSC Instrumentation, Running the samples, Interpretation of data & designing experiments	Dr Neelima Bulakh Ms Edna Joseph Ms Madhulika Bapat	Lab Block, VC
16:00 to 16:30	Tea		Foyer Area
16:30 to 17:30	Closure – Feedback, Certificate distribution	Dr V Premnath/ Manisha P	Training Room, VC

### Course Faculty

	<p><b>Dr. (Mrs.) Neelima Bulakh</b> <b>Scientist, CSIR- National Chemical Laboratory, Pune</b></p> <p>Neelima Bulakh is Ph.D in Material Science and having 30 years of research experience in the field of polymers. Her area of interest includes polymers, polymer blends, crystallization and structure property relationship in polymers. Her research includes fundamental understanding of molecular motions responsible for ductility of the polymers using different polymer techniques and NMR. Currently she is working on High Temperature Polymer Electrolyte Fuel Cells.</p>
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### Venture Center Team

	<p><b>Edna Joseph</b> <b>Associate Manager- Analytical Services, Venture Center</b></p> <p>Edna has several years of experience in setting up and managing Venture Center's Lab facilities. She has demonstrated knowledge and understanding of many analytical instruments. She has run and assisted in proof-of-concept projects. Many technical and scientific workshops, especially those with hands-on lab exercises with lab instruments have been conceptualized, planned and organized by her.</p>
	<p><b>Madhulika Bapat</b> <b>Lab Associate, Venture Center</b></p> <p>She is M.Sc in Biotechnology and has 5+ years of industry experience, with a recent work done as a Biotechnologist. Her responsibilities includes support incubatees and budding entrepreneurs by offering lab services; Contributing and ensuring smooth operations of lab block at VC; Operating lab in coordination with scientific mentors and advisors of the VC (including NCL scientists)</p>

		
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About the organizers	
	<p>The National Science and Technology Entrepreneurship Development Board (NSTEDB), Department of Science and Technology, Government of India has awarded Venture Center with the status of a NIDHI-CoE (National Initiative for Developing and Harnessing Innovations – Center of Excellence an umbrella programme conceived by DST). This award is accompanied by a grant of Rs. 50 Cr for 5 year duration to help Venture Center scale-up its activities and demonstrate greater success to accommodate more than 100 startups at any time and to upgrade and add new facilities for supporting science and technology based startups. <b>NIDHI-COE is catalyzed and supported by NSTEDB Division, Department of Science and Technology, New Delhi.</b> For more information, visit: <a href="http://nidhicoe.venturecenter.co.in/">http://nidhicoe.venturecenter.co.in/</a></p>
	<p>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 &amp; Technology’s National Science &amp; Technology Entrepreneurship Development Board (DST-NSTEDB). Venture Center focuses on technology enterprises offering products and services exploiting scientific expertise in the areas of materials, chemicals and biological sciences &amp; engineering. For more information, visit <a href="http://www.venturecenter.co.in/">http://www.venturecenter.co.in/</a></p>
	<p>National Chemical Laboratory (CSIR-NCL), Pune, established in 1950, is a constituent laboratory of Council of Scientific and Industrial Research (CSIR). CSIR-NCL is a science and knowledge based research, development and consulting organization. It is internationally known for its excellence in scientific research in chemistry and chemical engineering as well as for its outstanding track record of industrial research involving partnerships with industry from concept to commercialization. For more information, visit <a href="http://www.ncl-india.org/Default.aspx">http://www.ncl-india.org/Default.aspx</a></p>