

## **ABOUT DEE**

The Department of Energy & Environment is known for its dedicated research in the field of CO<sub>2</sub> sequestration using microalgae, Effluent treatment using solar energy, bio-energy, phyco-remediation, Computational fluid dynamics, wind energy, Solar - Thermal/ Electrical system improvements, energy efficient building design, and energy & environmental audit. The department is committed to translating its research into a real-time field solution to the society and industry where it meets out its ultimate objective.

## **THERMO GRAVIMETRIC ANALYSIS (TGA)**

TGA is the best tool to find the proximate analysis of any solid fuels. Other than fuel samples, it can also be used to find the thermal characteristics of any solid materials. The performance of the material varies with the environment, heating rate and temperature at which it is heated. This kind of information is highly required for fuel/material research and also for industrial applications such as compositional analysis of materials, rate of degradation, product lifetime, oxidative stability, evaluation of polymer flammabilities, thermal stabilities, determination of rancidity of edible oils, competitive product evaluation, measurement of oil extender content in elastomers.

## **TG-IR**

The combination of a Thermo gravimetric Analyzer (TGA) with an Infrared Spectrometer (TG-IR) is the most common type of Evolved Gas Analysis (EGA) in use today. By heating a sample on the TGA, a sample will release volatile materials or generate combustion components as it burns. These gases are then transferred to the IR cell, where the components can be identified. Because of its ability to detect functional groups, IR analysis allows greater understanding of the processes seen in the TGA. The PerkinElmer TL8000 transfer line is a state-of-the-art system for TG-IR. Unlike systems that simply move the gas from TGA 4000, the TL8000 is designed to make sure every component evolved in the TGA is transported to the IR.

## **CHNS/O**

Elemental composition is highly required to find the energy content of the material and in the assessment of quality of waste for safe disposal.

## **UV/VIS/NIR SPECTROSCOPY**

Integrating spheres, in combination with UV/Vis/NIR spectrophotometers are versatile for reflectance and scattered transmittance measurements for solid or liquid. Double-beam, double-monochromator design provides the highest stability coupled with the highest accuracy. Extension of the measurement range into the Near-IR region provides richer and complementary spectral information for compounds and materials. Application areas range from surface characterization of solids to the photometric analysis of turbid, colloidal, transparent and translucent samples. Typical uses encompass quality assurance testing and product development measurements on textiles, dyes, paper and glass.

## **FOURIER TRANSFORM INFRARED SPECTROSCOPY**

FTIR spectrometers (Fourier Transform Infrared Spectrometer) are widely used in organic synthesis, polymer science, pharmaceutical industry, polymer dielectrics, inorganic thin films, descuming, patterning, photolitho metallization, plasma etching, petrochemical engineering, sputtering, food analysis and rapid qualification of nutraceuticals. Also used in determination of oil content in membrane applied in compressed air sampling, hydrocarbons in environmental samples, estimation of oil and grease in water, biodiesel concentration measurements and analysis of bioethanol impurities.

## **DIFFERENTIAL SCANNING CALORIMETRY (DSC)**

DSC is a thermo analytical technique in which the difference in the amount of heat required to increase the temperature of a sample and reference is measured as a function of temperature. Generally, the temperature program for a DSC analysis is designed such that the sample holder temperature increases linearly as a function of time. Applications of DSC include detection of impurity, study of polymorphism, degree of crystalline, study of phase diagram, drug excipient compatibility study.

## SCOPE

The scope of the workshop is to introduce the sample preparation, basic principles of thermal analysis, data interpretation and demonstration of the instruments. As an outcome of the workshop, one can characterize polymers, organic or inorganic chemicals, metals, semiconductors and other common classes of materials.

## PROGRAM DETAILS

Sessions will be handled by experts from leading institutes and industries. Theoretical sessions will be followed by demonstration of the instruments.

### Date to Remember

Deadline for submitting DD, **14<sup>th</sup> December 2018.**

### Eligibility

Persons from Industries, academic and research institutions are eligible.

### How to Register

Candidates have to register by sending an email to: [ceesat.events@gmail.com](mailto:ceesat.events@gmail.com) Send registration details including the name, designation, Place of work, Payment details, DD no, DD Date to the above email address.

Total number of participants is restricted to 40. (First come first serve basis).

### Registration Fee

Rs. 2500+18% GST – Postgraduates/Research scholars

Rs. 3500+18% GST – Faculty

Rs. 5000+ 18% GST –Industrial Participants

Registration fee must be paid in the form of DD in favor of "**The Director, NIT Trichy**" payable at Trichy.

**Coordinators:** Dr. N. Anantharaman, HoD

Dr. M. Premalatha, Professor

Dr. Ruben Sudhakar D, Assistant Professor

**Venue:** DEE, NIT Trichy.

### Contact Details

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Organized by



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