

TCIS, Hyderabad

Course: Advanced Experimental Methods

Start Date: 14th August

Coordinates (Preferred): Friday (Morning)

Instructor: T N Narayanan & G Rajalakshmi

Syllabus:

(6X2 = 12 Credits)

1. Study the hyperfine spectrum of Rb.

Aim: Studies on Doppler Free atomic absorption spectroscopy of Rb gas. Understanding line broadening mechanisms in atomic spectroscopy

2. Molecular Spectroscopy using Raman +FTIR+UV-Vis +Photoluminescence measurements.

Aim: Identifying the molecular vibration modes of the given molecule (ex: Methylene blue). Theoretical calculation of molecular vibration bonds using simple harmonic approximation (bond strength/constant will be given) and experimental comparison. Identifying the electronic transitions and bandgap.

3. Heterogeneous Electron Transfer Studies.

Aim: Studies on the heterogeneous electron transfer phenomena in inner and outer redox probes using cyclic voltammetry.

4. Magneto-Resistance Measurement on thin films.

Aim: Studies on the MR measurements on metallic (Au/Cu)/non-metallic thin films developed using thermal evaporation/spin coating techniques.

5. Earth field NMR/ 300 MHz.

Aim: Understanding the principle of NMR spectroscopy.

6. Contact Angle Measurement.

Aim: Surface Tension measurements on various liquids using pendant drop method and surface energy of a solid surface using sessile drop method and Zisman plot method.

Primary Text / Reference Books:

1. Manuals available with the instructors.