CY-312 SPECTROSCOPY

Infrared Spectrophotometry: Interaction of IR radiation with molecules, Types of molecular vibration, Selection rules, Instrumentation, Optical materials, Sources, Detectors used in IR spectroscopy, Interferometric (Fourier Transform), Spectrophotometers, Calibration and standardization, Preparation of samples for the analysis of solids, Liquids and gases.

Nuclear Magnetic Resonance Spectroscopy: Introduction, Chemical shift, Spin-spin splitting (spin coupling), Relaxation times

NMR Instrumentation: Magnets, Sample probes, Radiofrequency sources, Detectors, Techniques in instrumentation, Sample handling, NMR solvents, Purity, Reference compounds (TMS).

Quantitative Aspects: ^1^H-NMR Interpretation, Structure elucidation, ^13^C-NMR Interpretation, Structure elucidation.

Mass Spectrometry: Introduction to mass spectrometry, EI, CI, FAB, MALDI MS. Instrument components, Behavior and interpretation of various classes of compounds in mass spectrometry, Applications in chemical analysis.

Luminescence Spectrometry: Introduction, Types of luminescence, Energy level, Luminescent molecules, Process involving excited states i. e. Absorption, Vibrational relaxation, Internal conversion, Florescence, Intersystem crossing, and Phosphorescence. Instrumentation for fluorescence measurements and phosphorescence measurements.

Atomic Absorption Spectroscopy: Flame and Electro thermal Atomization Method; Sample Atomization, Types and sources of atomic spectra, Radiation souces, Burner and nebulizer, Atomization cells, Atomic absorption spectroscopy, Flame emission spectroscopy, Interferences and their control.

Atomic Emission Spectroscopy: Use of Gotrian diagram. Phenomenon of flame emission and interferences encountered in flame emission