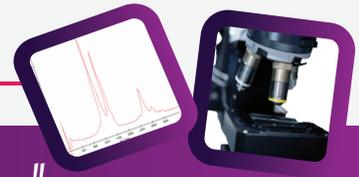


"Exploration is the engine that drives innovations"



**FOURIER TRANSFORM INFRARED (FTIR)**

FTIR can provide:

1. Identification of functional groups in the sample
  2. Determination of the quality or consistency of a sample
  3. Determination of the amount of components in a mixture
- Range of wavelength is between 400nm to 4000nm



**UV VISIBLE SPECTROPHOTOMETER (UV-VIS)**

Quantitative analysis of materials in solutions via UV-visible spectrophotometric technique. This equipment able for scanning, kinetic studies and calibration curve measurements. Range of wavelength is between 1100nm to 190nm.



**THERMO GRAVIMETRIC ANALYZER (TGA/DSC)**

Able to measure the changes in properties of materials as they are heated. This equipment provides two methods of measurement, i.e. Thermo gravimetric Analysis (TGA) and Differential Scanning Calorimetry (DSC). Temperature Range: 25°C to 1600°C.



**GAS CHROMATOGRAPHY (GC)**

A gas chromatograph is a chemical analysis instrument for separating chemicals in a complex sample. This model provides two different types of inlets which are split/ split less and Programmable Cool On-Column Inlet. The detector type is Flame Ionization Detector (FID) and Thermal Conductivity Detector (TCD).



For further inquiries, please do not hesitate to contact us at [itma\\_analysis@upm.edu.my](mailto:itma_analysis@upm.edu.my)  
Visit : [www.itma.upm.edu.my](http://www.itma.upm.edu.my)



NANO SIZER

To analyze particles sizes between 6 nm and 6 $\mu$ m



SURFACE AREA ANALYZER (BET)

To characterize the surface area and porosity of materials. This equipment can analyze specific BET surface area of > 0.01 m<sup>2</sup>/g and the pore size distributions in the range 0.35 to 200 nm of solids materials.



UNIVERSAL TESTING MACHINE (UTM)

UTM is used to perform tensile, compression and flexural testing of a material. It has a load frame of 10 kN capacity and tension compression load cell of 10 kN and 1kN capacity.



WIRE BONDER

Able to bond gold wires ranging from 0.0007in to 0.002in. Bonds are made by the ball-to-wedge technique using ultrasonic energy and work piece heat. The operator uses hand/eye reference to bond targets and elevations guides the bonding tool manually.



ATOMIC ABSORPTION SPECTROSCOPY (AAS)

Determines the presence of metal elements in liquid samples and also measures the concentrations of metals in the solution.



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Visit : [www.itma.upm.edu.my](http://www.itma.upm.edu.my)



## HYSTERESIS GRAPH SYSTEM

Able to measure magnetic characteristic parameters of the sample, such as initial permeability ( $\mu_i$ ), maximum permeability ( $\mu_m$ ), saturation magnetic induction ( $B_s$ ), remanence ( $B_r$ ), hysteresis losses ( $P_u$ ) etc. This equipment has three different systems:

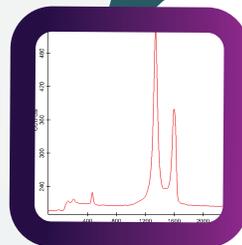
- i. DC Static Hysteresis graph System for Soft Magnetic Materials
- ii. AC Dynamic Hysteresis graph System for Soft Magnetic Materials
- iii. Magnetic Automatic Test System for Permanent Magnet



## FESEM

Ultra High Resolution Scanning Electron Microscope (FESEM) with Electron Diffraction X-ray Spectroscopy.

Able to produce enlarged images of a variety of specimens, achieving magnifications of over 500,000x providing ultra-high resolution imaging in a digital format. This equipment has two operating vacuum modes to deal with different types of sample i.e high vacuum (HiVac) dan low vacuum (LowVac).



## RAMAN SPECTROSCOPY

Able to determine the chemical structure of a sample and identify the compounds present by measuring molecular vibrations.

Available laser excitations are 488nm, 532nm and 633nm. There are several types of analyses such as single spectrum, mapping and line scanning.



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