

ELECTRON SPECTROSCOPY FOR CHEMICAL ANALYSIS (ESCA) OR X-RAY PHOTOELECTRON SPECTROSCOPY (XPS)

Make:

Thermo Scientific

Model: ESCALAB 250XI BASE SYSTEM WITH UPS AND XPS IMAGE MAPPING

Sources:

XR6 Micro-focused Monochromator (Al K α XPS)

XR4 Twin Anode Mg/Al (300/400W) X-Ray Source.

EX06 Ion gun

Detector:

Two types of detectors ensures optimum detection for each type of analysis- two dimensional detector for imaging and a detector based on channel electron multipliers for spectroscopy when high count rates are to be detected

Salient Features:

Twin anode non-monochromated XPS

Fast Parallel Imaging(XPI)

Depth profiling capability

UV Photoelectron Spectroscopy(UPS)

Large area XPS(LAXPS)

Energy Resolution

Angle resolved XPS

E-Beam Evaporator

Small area XPS (SAXPS)

Insulator analysis

Ion scattering spectroscopy(ISS)

REELS Facility

Applications of ESCA 250 Xi:

- ESCA is unique and non destructive tool to study the surfaces of the materials
- The surfaces of a corroding sample can be analysed.
- Contamination in the matrix of a catalyst can be analysed qualitatively and quantitatively
- Inter faces (SEI in Li ion battery) of energy storage devises can be analysed qualitatively and quantitatively
- Depth profiling which may give elemental composition as function of depth (1-2 μ) can be done

Sample Requirements:

- Solid Samples in the form of pellets of 6mm or 8mm diameter.
- Thin films of area 10 mm² Thickness 2 to 3 mm.



X-RAY PHOTOELECTRON SPECTROSCOPY (XPS)

Make:

Thermo Scientific

Model: : MULTILAB 2000 Base system with X-Ray, Auger and ISS attachments.

Sources:

Twin Anode Mg/Al (300/400W) X-Ray Source.

EX05 Ion gun for etching and ISS studies.

Electron Gun with spot size < 50 μ m dia.

Detector:

- 110 mm radius hemispherical analyzer with 7 channeltrons.

- 4 variable analyzer slits viz 5, 2, 1 mm and \square 4mm.

- Operates in CAE (Constant Analyser Energy) and CRR (Constant Retard Ratio) modes.

Salient Features:

- Sample heating and cooling stages in preparation and Analysis Chamber.
- Sample manipulator with high precision four axes movement.
- CCD camera and zoom microscope for optical viewing of the samples.

Applications of MULTILAB 2000:

- What elements and the quantity of those elements that are present within the top 1-12nm of the sample surface
- What contamination, if any, exists on the surface or in the bulk of the sample
- Empirical formula of a material that is free of excessive surface contamination
- The chemical state identification of one or more of the elements in the sample
- The binding energy of one or more electronic states
- The thickness of one or more thin layers (1-8nm) of different materials within the top 12nm of the surfaces.

Sample Requirements:

- Solid Samples in the form of pellets of 6mm or 8mm diameter.
- Thin films of area 10 mm² and Thickness 2 to 3 mm.

