

A complete list of the analytical - characterization services available from the ASU is presented below:

Analysis Description

Instrument

Morphology observation, quantitative elemental analysis and surface mapping of solid samples by Scanning Electron Microscopy (SEM)

JEOL 6300 & Oxford ISIS 2000

Morphology, nanoparticles size measurement, structural properties, crystalline phase characterization by X-ray Diffraction (XRD)

JEOL JEM 2010 & Oxford INCA

Identification of Crystalline Phases in Solids (XRD)

Siemens D-500

Unit Cell Size of Zeolites (XRD)

Siemens D-500

Surface Area (N₂ sorption)

Autosorb-1, Quantachrome

Micropore Surface Area and Volume (N₂ sorption, t-plot method)

Autosorb-1, Quantachrome

Pore Size Distribution (N₂ sorption)

Autosorb-1, Quantachrome

Particle Size Distribution by laser diffraction (wet dispersion, no dispersive)

Mastersizer-S, Malvern

Particle Size Distribution by laser diffraction (wet dispersion, with dispersive)

Mastersizer-S, Malvern

Particle Size Distribution by laser diffraction (dry dispersion)

Mastersizer-S, Malvern

Elemental Analysis by Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES)

Optima 4300 DV, Perkin Elmer

V and Ni in FCC catalysts- ICP-AES

Optima 4300 DV, Perkin Elmer

Rare Earths (La, Ce, Nd, Pr, Sm) in FCC catalysts- ICP-AES

Optima 4300 DV, Perkin Elmer

Cu, Fe in wine samples - ICP-AES

Optima 4300 DV, Perkin Elmer

Toxic metals (Cd, Cr, Cu, Ni, Zn, Pb, As) in water and wastes - ICP-AES

Optima 4300 DV, Perkin Elmer

Metals (Ca, Mg, Fe, Ti, Na, K, P) in ashes - ICP-AES

Optima 4300 DV, Perkin Elmer

Fe, Mn and Zn in ferrites

Optima 4300 DV, Perkin Elmer

Study of solids with Temperature Programmed Methods and MS detector (TPD-H₂, TPD-NH₃, TPR, TP

AMI-1, Altamira & Omnistar Balzers

Thermal analysis, TGA, DSC, DTA

SDT 2960, TA instruments

To ensure the best results for our clients, the Analytical Services Unit has implemented a comprehensive Quality Control/Quality Assurance Program. Quality Assurance is a set of operating principles that, if strictly followed during the sample delivery and analysis, will produce accurate data of defensible quality. This program is designed to comply with ISO 9002 regulatory agencies and applies to all samples submitted to the laboratory. A comprehensive Quality Control/Quality Assurance Program is in place in the unit.

Elements of the QA/QC program include:

- Staff organization, responsibilities and training requirements
- Sample control and documentation procedures
- Standard operating procedures (SOP) and method audits
- Internal quality control activities and corrective action procedures
- Equipment calibration and preventive maintenance procedures
- Data quality assessment and reporting system

Quality assurance audits, such as inter-comparison studies, internal standards, quality control samples, and replication samples are used to maintain quality analytical results. Our QA/QC program has been established for our customers, to ensure them that their results are accurate and precise.

All instruments are validated on a regular basis, according to standard procedures. The instrument response must be within specified limits. Also, to ensure rapid turn around, the instruments are properly maintained.

It is essential to ensure sample integrity from sample collection to data reporting. This includes the ability to trace possession and handling of the samples from the time of collection through analysis and final disposition. This process is referred to as chain-of-custody. At ASU chain-of-custody is managed as follows:

- Sealed, labeled samples are delivered to the laboratory by the client.
- Upon receipt of the sample, a chain-of-custody form is completed and signed by both the client's field technician and the receiving Analytical Laboratory technician. The date, time, sample name and any particular preservation instructions are recorded .
 - In the laboratory, the sample custodian inspects the sample condition, assigns a lab number and logs the sample into the laboratory log book.
 - The sample custodian obtains the sample analysis requirements and schedules the sample for the various tests required.