MATERIALS CHARACTERIZATION UNIT AT WISE-Futures CENTRE OF NM-AIST

www.wisefutures.ac.tz

Introduction:

- The Materials Characterization Unit at WISE–Futures Centre, NM-AIST, is equipped with cutting-edge instrumentation to support advanced materials analysis. Our key technologies, the Alpha300R Raman-FTIR Microscope, Micromeritics ASAP 2020 Plus, and X-ray Diffraction (XRD) Analyzer offer powerful capabilities for non-destructive chemical imaging, surface area and porosity measurements, and detailed structural analysis of crystalline materials. These systems serve diverse research and industrial needs across fields such as nanotechnology, pharmaceuticals, catalysis, polymers, and environmental science.

- We are committed to delivering high-quality, accurate, and timely results to drive innovation and scientific excellence.

The Team:

- Meet our Laboratory technicians team who plays a critical role in the material characterization process. With specialized expertise in sample preparation, instrumentation, and analytical protocols, they ensure the accuracy, consistency, and reliability of all laboratory results.

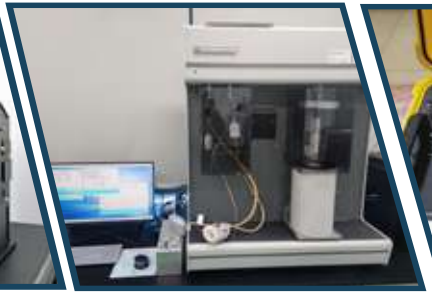
Faraja R. Nkyabonaki
Laboratory Technician

Gillian Kissakwa
Laboratory Technician

Regina P. Bifakwaya
Laboratory Technician

Zilpa F. Masashua
Laboratory Technician

AVAILABLE EQUIPMENTS & SERVICE PROVIDED



Map Molecules. Understand Materials. Non-Destructively

ALPHA300R RAMAN-FTIR

EXPLORE MATERIALS LIKE NEVER BEFORE WITH THE ALPHA300R RAMAN-FTIR MICROSCOPE

ONLY FOR
TZS. 63,000/=
PER SAMPLE

Let your research see deeper. get in touch to schedule your analysis today.

Gain molecular-level insight into your materials with our state-of-the-art Raman-FTIR Microscope.
The Alpha300R system enables non-destructive chemical imaging with exceptional spatial resolution. Whether you're solving complex research questions or optimizing product quality, our platform delivers fast, accurate, and clear results.

WHAT WE OFFER

- **High-resolution Raman imaging**
  Visualize molecular distributions and interfaces with micro-scale precision.
- **Chemical fingerprinting (organic & inorganic)**
  Identify unknown substances or confirm compound composition through unique vibrational spectra.
- **Spectral mapping**
  Create full-field chemical maps of your sample's surface.
- **Non-destructive testing**
  Analyze without altering or damaging your samples—ideal for precious or limited materials.

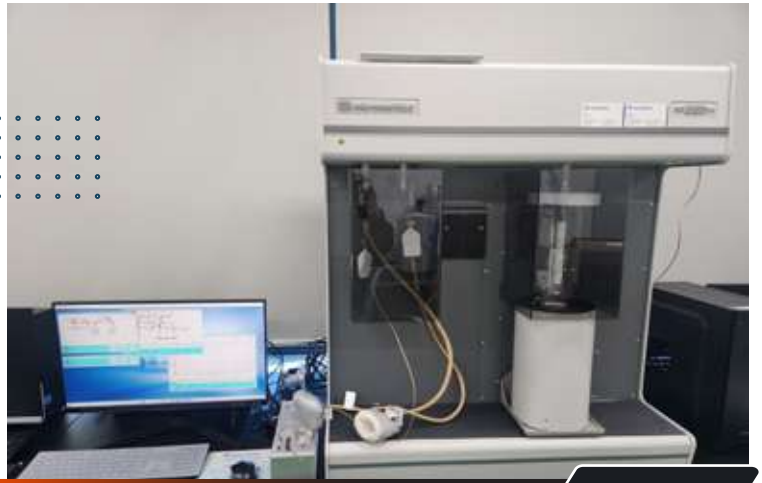
ALPHA300R RAMAN-FTIR

SUITABLE SAMPLE TYPES

- Solid materials and composites
- Powders and granules
- Thin films and coatings
- Gels, pastes and soft materials
- Microstructured surfaces

IDEAL RESEARCH AREAS

- Nanotechnology and Advanced Materials
- Pharmaceutical and Biomedical Studies
- Polymer Science, Coatings and Inks
- Environmental Monitoring and Forensics
- Food Safety and Agricultural Quality Control



ADVANCED SURFACE AREA AND POROSITY ANALYSIS

ONLY FOR TZS. 68,500/= PER SAMPLE

WHAT WE OFFER

Physisorption Analysis

- Specific Surface Area (BET method)
- Pore Size Distribution (BJH method: adsorption, desorption, or both)
- Micropore Analysis (t-Plot, Horvath-Kawazoe methods)
- Ideal for materials such as activated carbon, silica gels, zeolites, and other porous solids.

Chemisorption Analysis

- Active Metal Surface Area
- Metal Dispersion and Loading Stoichiometry Factors Atomic Cross-Sectional Area
- Suitable for catalysts and reactive materials requiring surface chemistry profiling.

WHO CAN BENEFIT

- Academic researchers in materials science, chemistry, and environmental science
- Industry professionals in energy, water, construction, and pharmaceuticals
- Students needing support for theses and innovations

Available gases: Hydrogen, Helium and Nitrogen.
All analyses are conducted under controlled, optimized conditions for accuracy and reproducibility.

UNLOCK THE HIDDEN STRUCTURE OF YOUR MATERIALS WITH

X-RAY DIFFRACTION (XRD) ANALYSIS

For only TZS. 55,000/= Per sample

Delivering Clarity in Every Crystal.
Book your XRD analysis today.

Our state-of-the-art X-ray Diffraction (XRD) facility enables you to investigate the crystal structure, phase composition, and material purity of your samples with unmatched precision.

Whether you're researching novel compounds or ensuring material quality, our service delivers scientifically validated results with fast turn around.

It's Capabilities:

- **Crystal Structure and Phase Identification**
  Determine the exact atomic arrangement and identify unknown crystalline materials.
- **Quantitative Phase Analysis**
  Measure the amount of each crystalline phase in your sample with high accuracy.
- **Polymorphism Detection**
  Distinguish between multiple forms of the same compound – crucial for pharmaceuticals and advanced materials.
- **Tailored Analysis Options**
  Customized scan settings for unique or sensitive materials (e.g., low crystallinity, amorphous background subtraction).

Sample Types & Requirements:

- **Powders**
  Approx. 0.5 g, particle size < 45 µm
- **Solids**
  Flat samples, up to 25 mm diameter
- **Conditions**
  Must be stable at room temperature and low humidity

Ideal for Applications In:

- Materials Science and Engineering
- Geology & Mineral Exploration
- Pharmaceuticals and Polymorphism Studies
- Ceramic and Polymer Characterization
- Metallurgy and Failure Analysis

SAMPLE SUBMISSION

FOR XRD, BET AND RAMAN MICROSCOPY

The client is required to fill out the request form and submit it to our laboratory technician. Accurate and complete information ensures efficient processing, proper identification, and reliable analysis and sample results. He/she must ensure each sample is clearly labeled and corresponds to the details provided on the form below.

Material Characterization Request Form

XRD and Raman Microscopy

Section 1: Submitter Information

Name: _____

Organization / Department: _____

Email: _____

Phone: _____

Date: _____

Section 2: Sample Information

Number of Samples: _____

Sample ID: _____

Physical State (✓ one): [ ] Powder [ ] Solid [ ] Liquid [ ] Thin Film [ ] Gel [ ] Other: _____

Substrate Material (if applicable): _____

Expected Composition / Target Material:

Known Hazards (✓ all that apply): [ ] None [ ] Toxic [ ] Reactive [ ] Biologically Active [ ] Flammable [ ] Corrosive [ ] Other: _____

Handling Precautions:

_____

_____

Section 3: Analysis Details

Analysis Technique Requested (✓ all that apply):

[ ] XRD

[ ] Raman Microscopy

For Raman:

Is the sample sensitive to laser/heat/light? [ ] Yes [ ] No [ ] Unknown

If yes, explain: _____

Does the sample fluoresce (glow)? [ ] Yes [ ] No [ ] Unknown

If yes, under which laser wavelengths? _____

Analysis Goal (✓ one or more):

[ ] Get average/bulk spectrum

[ ] Map distribution of components

[ ] Other: _____

For XRD:

Special Analysis Settings (if any):

_____

Sample Requirements (Read Before Submitting):

- **Powder:** ~0.5 g, fine particles (< 45 µm)
- **Solid:** Flat surface, max ~25 mm diameter
- Must be stable under lab conditions

Section 4: Packaging Guidelines

Label each sample clearly

Use clean, sealed containers

For sensitive/hazardous samples:

- Use airtight packaging
- Mark hazards clearly
- Include MSDS if available

Section 5: Acknowledgement

I confirm the sample information is correct, all hazards are declared, and submission guidelines have been followed.

Signature: _____

Name: _____

Date: _____

For Lab Use Only

Date Received: _____

Received By: _____

Lab ID: _____

Operator: _____

Analysis Date: _____

Date Results Sent: _____

SAMPLE HANDLING

- Ensure samples are dry, clean, and well-labeled
- Use appropriate airtight containers
- **Minimum quantities:**
  - Micromeritics ASAP 2020 Plus: 1 to 2 g
  - XRD: 1 to 2 g
  - Raman-FTIR: small specs or thin films
- **Indicate:**
  - Moisture sensitivity
  - Any special handling needs

PAYMENT INFORMATION

PAYMENT METHODS ACCEPTED

- The payment of the sample analysis will be done via bank through the Centre's Bank account.

PAYMENT TERMS:

- Full payment before analysis
- Include payment receipt/reference with the sample

TURNAROUND TIME :

- **BET Surface Area & Porosity:** 3 to 5 working days
- **XRD Analysis:** 1 to 2 working days
- **Raman-FTIR:** 1 to 2 working days

Note: *Turnaround may vary depending on queue, sample condition, and complexity. Urgent requests can be discussed in advance.*

RESULTS SHARING

RESULTS SHARING

- **Standard Output:**
  - Raw data files
  - Instrument-specific output formats (e.g., .smp, .xrdml, .spc)

Processed Reports:

  - Summary reports and plots are available.
  - Custom analysis (e.g., pore size distribution plots, crystalline phase ID, spectra interpretation)

- **Delivery Methods:**
  - Email (PDF or zipped folder)
  - Cloud link (Google Drive, upon request)
- **Retention Policy:**
  - Raw data is stored for up to 30 days after submission of results.

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