The Spectrometry Laboratory

It includes high-performance equipment: ICP-MS with specs, UV-Vis-NIR Laboratory Spectrophotometer, Laboratory FT-IR Spectrometer with Microscope and Total Reflection X-ray Spectrometer (TXRF) for solid samples and liquids.

This equipment is used for:

- identification and quantification of microplastics in environmental samples;
- compositional and structural characterization of compounds present in the environment;
- analysis of optical properties (transmittance, reflectance and absorbance) of liquid and solid environmental samples;
- rapid analysis and quantification of multi-elements (metals and non-metals) in environmental samples.

The Spectrometry Laboratory

Members:

- **Lecturer Dr. Mihaela TIMOFTI**
  https://dcfm.ugal.ro/index.php/membri/2-uncategorised/40-timofti-mihaela

- **PhD Student Mădălina CĂLMUC**
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- **PhD Student Valentina Andreea CĂLMUC**
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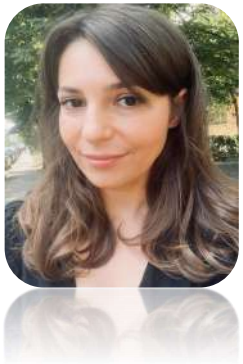
The Spectrometry Laboratory

Members:



PhD Ira-Adeline Simionov
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The Spectrometry Laboratory

Equipment:

Spectrum 3 Laboratory FT-IR Spectrometer with Spotlight 400 Microscope, PerkinElmer

Uses:

- analysis of microplastics, drugs, additives, hydrocarbons;
- material analysis;
- forensics;
- biomedical research;
- biomaterials;
- cultural heritage;
- food industry.

Technical specifications:

- spectral range: 7800-600 cm-1 (microscope module) and 14700 - 350 cm-1 (FT-IR module);
- spectrum acquisition rate - 170 full spectra/ second;
- signed-to-noise ratio (25 µ pixel size, 16 cm-1 spectral resolution, 4 scans)> 800: 1;
- ATR image pixel size: 6.25 µ, 1.56 µ.

The Spectrometry Laboratory

Equipment:

UV-Vis-NIR laboratory spectrophotometer, Model Cary 5000, Agilent

Uses:

- qualitative, quantitative and structural analysis of samples;
- drug analysis;
- DNA and protein detection;
- detection of pesticide residues in aquaculture;
- detection of soil and plant tissue composition, enzymes, minerals, vitamins, food additives;
- monitoring water, soil and atmosphere quality;
- analysis of chlorophyll pigments;
- collecting spectra for various environmental samples to create a database;
- pharmaceutical industry;
- life science;
- environmental monitoring;
- chemistry and petrochemistry, biofuels;
- biotechnology, food and agriculture.

The Spectrometry Laboratory

Equipment:

UV-Vis-NIR laboratory spectrophotometer, Model Cary 5000, Agilent

Technical specifications:

- spectral range: 175 - 3300 nm
- measurement over 8.0 absorbance units with reference beam attenuation;
- spectral bandwidth: UV-Vis 0.01 - 5.00 nm, NIR 0.04 - 20 nm;
- light source: visible tungsten halogen and UV deuterium arc;
- integrating sphere with a spectral range between 200 and 2500 nm;
- diffuse reflectance accessory (DRA);
- variable slit widths (up to 0.01 nm) for optimal control over data resolution;
- the accuracy of the spectrophotometry method is less than 0.4%.

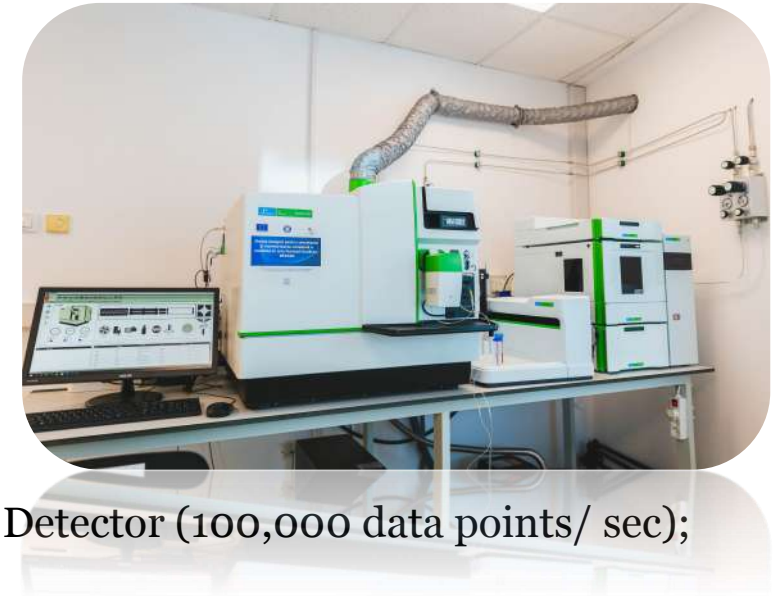
The Spectrometry Laboratory

Equipment:

ICP-MS with speciation Nexion 2000C, PerkinElmer

Uses:

- detection of metals, metalloids, heavy metals, traces of metals, alkali metals, alkaline earth metals, non-metals (phosphorus, sulfur, bromine, selenium, iodine);
- analysis of nanoparticles, metalloproteins;
- analysis of environmental evidence (biotic and abiotic);
- food and agriculture industry, biomedical industry, pharmaceutical industry;
- analysis of geological evidence and archaeological evidence;
- forensics.



Technical specifications:

- detection limit ppq (10-15);
- metal speciation (isotope analysis);
- extended dynamic range (EDR);
- All Matrix Solution (AMS);
- Dynamic Bandpass Tuning in reaction model;
- data acquisition system: Simultaneous Dual Mode Detector (100,000 data points/ sec);
- table range: 1-285 amu.

The Spectrometry Laboratory

Equipment:

Total Reflection X-ray Spectrometer (TXRF) for solid and liquid samples, Model S4 Tstar, Bruker Germany

Uses:

- non-destructive analysis of the chemical elements: Na – U range (exception Nb to Ru).
- analysis of liquid samples, suspensions, powders, particles, metals, thin layers, tissues, filters etc.

Technical specifications:

- detection limit ppb (µg/L);
- direct analysis without sample digestion with results on the spot;
- analysis of particles up to 100 µm in diameter, powders up to 10µg;
- requires a small amount of sample: maximum 50µl;
- the detector is cooled by the Peltier effect;