The Physical - Chemical Analyses Laboratory

is devoted to applications involving the use of various analytical methods (volumetric, electrochemical, spectrometric, and chromatographic) and the rapid screening of the quality of biotic and abiotic environmental factors.

The **Physical-Chemical Analyses laboratory** includes equipment which may be used for:

- quantitative analysis of inorganic and organic pollutants in water, soil, and air;
- identification and quantification of plastics in surface water and sediment;
- determination of the physico-chemical quality of surface waters in accordance with law regulations (e.g. the Water Framework Directive);
- in-situ monitoring of different pollution events/accidents (e.g. water pollution by oil products);
- establishment of water pollution hotspots along the Danube.

The Physico - chemical Analyses Laboratory

Members:

Associate prof. PhD. Mihaela TIMOFTI - https://dcfm.ugal.ro/index.php/membri/2-uncategorised/40-timofti-mihaela

Research Assist. PhD. Stud. Mădălina CĂLMUC – https://scholar.google.com/citations?hl=en&user=-V86bqYAAAAJ

Research Assist. PhD. Stud. Valentina-Andreea CĂLMUC – https://scholar.google.com/citations?hl=en&user=NcroOfkAAAAJ

Assist. univ. dr. ing. Ira-Adeline SIMIONOV - https://www.researchgate.net/profile/Ira-Adeline-Simionov

Research Assist. PhD. Eng. Nina-Nicoleta LAZĂR - https://scholar.google.com/citations?hl=ro&user=9Sau-xgAAAAJ

Research Assist. PhD. Eng. Adelina-Ştefania MILEA - https://scholar.google.com/citations?hl=ro&user=qHWx48MAAAAJ

Research Assist. PhD. Eng. Miruna CODREANU - https://scholar.google.com/citations?hl=ro&user=DiWBP74AAAAJ

Research Assist. PhD. Ancuţa DINU - https://scholar.google.com/citations?hl=ro&user=BsYFfZkAAAAJ

Research Assist. PhD. Eng. Alina ANTACHE - https://scholar.google.com/citations?hl=ro&user=5Svg-qwAAAAJ

The Physicochemical Analyses Laboratory

Equipment:

Hydrocarbon analyzer InfraCal 2, model TRANS-SP, AMETEK Spectro Scientific

Uses:

- analysis of total petroleum hydrocarbons (TPH) in water and soil;
- analysis of FOG (fats, oil, and grease) in wastewater;
- onsite testing of soil at remediation sites.

Technical specifications:

- portable equipment which allows in-situ analysis of samples;
- measurement range for water: 0.1-1000 ppm;
- measurement range for soil: 1-5000 ppm.

The Physico– chemical Analyses Laboratory

Equipment:

Multiparameter Benchtop, model ORION VERSA STAR 90, Thermo Fisher Scientific

Uses:

- analysis of pH, F- concentration, conductivity, dissolved oxygen, and temperature in different types of samples;
- recording up to 2000 time/date data sets which can be easily transferred via USB or RS232 to a computer.

Technical specifications:

- pH accuracy: ±0.002;
- conductivity measurement range (C): 0.001 µS/cm to 3000 mS/cm;
- C Accuracy : 0.5% of reading ±1 digit > 3 µS; 0.5% of reading ±0.01 µS ≤ 3 µS;
- percentage range of dissolved oxygen saturation (OD): 0.0 to 600.0% saturation;
- OD accuracy: ±0.2 mg/L or ±2% of reading, whichever is greater.

The Physico– chemical Analyses Laboratory

Equipment:

Portable FT-IR spectrometer, model ALPHA II, Bruker Optics GmbH & Co. KG

Uses:

- identification of meso and macroplastics from environmental samples;
- verifying the integrity of products and quality of incoming raw materials;
- qualitative analysis of drugs, pharmaceuticals, additives, hydrocarbons.

Technical specifications:

- temperature-controlled DLaTGS-detector;
- spectral range: 350 – 8 000 cm-1 with a resolution of 0.75 cm-1;
- signal-to-noise ratio: >55,000:1 for one-minute measurement time;
- features ATR with diamond crystal.

The Physico– chemical Analyses Laboratory

Equipment:

Automatic titrator, model Eco Titrator Acid/Base, Metrohm AG

Uses:

- volumetric analysis of the following indicators:
- carbon dioxide, free chlorine in drinking water, chlorides, calcium and magnesium hardness, total hardness, chemical oxygen consumption, etc.

Technical specifications:

- integrated stirrer;
- burettes of 10 and 20 ml;
- pH electrode for titrations in aqueous media;
- pH electrode for titrations in non-aqueous environments;
- electrode for determining Calcium, Magnesium and hardness;
- electrode for determination of chlorides;
- electrode for determining CCO-Cr.

The Physico– chemical Analyses Laboratory

Equipment:

Portable GC-MS, model Torion T9, Perkin Elmer

Uses:

- applications in the following fields: environment, food industry, forensic analysis;
- rapid in situ screening of volatile and semivolatile substances, such as pesticides, explosives, and pharmaceuticals.

Technical specifications:

- portable, lightweight GC/MS, weight: approx 15 kg;
- mass Range: 41-500 m/z;
- number of samples analyzed: 12 samples per hour;
- detection limit: ppt to ppb for most analytes;
- autonomy: 2.5 hours.