

1. HPLC/ICP-MS (Agilent)

A Bio-Inert HPLC Model 1260 is coupled to a spectrophotometer ICP-MS Model 8800 equipped with a triple quadrupole mass analyzer. This HPLC/ICP-MS hyphenated system is an innovative and advanced instrumentation able to combine ICP versatility with advantages of tandem MS detection. It allows analysis of real samples without spectral interferences and provided results are more accurate, particularly with very complex matrices. It can be used for different applications, such as environmental, food or semiconductor analysis. This instrumentation is very flexible and it fulfills specific research needs as well as high throughput for routine analysis due to a wide range of tandem MS acquisition modes, that enable also to study ion-molecule reactions and formation of polyatomic ions.



2. MERCURY ANALYZER (Perkin-Elmer)

Atomic Absorption Spectrophotometer and thermal decomposition for direct analysis of mercury. It is able to process either liquid or solid samples for both quali- and quantitative analysis.



3. ATOMIC ABSORPTION SPECTROMETER (Perkin-Elmer)

Analyst 800 Model, equipped with a double beam optics, two integrated flame and graphite furnace atomizers, autosampler for graphite furnace, segmented photodiode array detector. The graphite furnace uses transverse heating. The instrument allows Zeeman effect (for electrothermal atomizer) and deuterium (for flame atomizer) background corrections.



4. PLASMA OPTICAL EMISSION SPECTROMETER (Perkin-Elmer)

It allows analysis over a 165-403 nm spectral range and it is equipped with axial plasma torch, cyclonic spray chamber and low-flow nebulizers, segmented diode array detector and autosampler.



5.

6. MICROWAVE OVEN (Milestone)

It enables over pressurized acid digestion of samples for atomic spectroscopic analysis (AAS or AES). It allows to prepare up to six samples simultaneously at maximum pressure of 110 bars and highest temperature of 300° C. it is equipped with temperature probe and external control module.

7. HPLC/MS (Thermo)

It combines a micro-HPLC Surveyor Plus model (thermostated autosampler and column compartment, quaternary pump) and a LTQ-XL model mass spectrometer with linear ion trap mass analyzer. ESI and APCI interfaces are available. It allows separation and identification of both environmentally relevant (persistent organic contaminants) and synthetic organic molecules (new derivatives with pharmacological activities), biologically relevant compounds and molecules involved in food chemistry and nutraceuticals (peptides, proteins, vitamins, antioxidant compounds).



8. CE-DAD-LIF (Agilent)

Model 7100 capillary electrophoresis, equipped with autosampler, Uv-Vis diode array detector (DAD) and fluorescence detector (LIF). It is employed in environmental research studies (determination of persistent organic contaminants, umic acids, pesticides, etc.), as well as for bioanalysis (nanostructured materials, bioactive molecules, development of innovative carrier for drug delivery), food chemistry and toxicological analytical determinations.



9. GC/MS (Agilent and Thermo)

The Agilent 6850 GC system comprises a CTC autosampler for liquid injection and head space analysis. It is hyphenated with a 5975 MS equipped with a single quadrupole mass analyzer. This system can be employed for trace determination of organic compounds in environmental matrices. Thermo Polaris Q instrument is based on ion trap mass analyzer. It is dedicated to the determination of molecular markers such as organic compounds adsorbed on fine atmospheric particulate matter.



10. ELEMENTAL ANALYZER (Thermo)

The Flash 2000 model allows analysis of C, H, N, S and O. It has a 30 positions autosampler, combustion and pyrolysis cells and a thermos-conductivity detector. It is used for determination of relative amount by weight of each single element in organic and inorganic samples.

11. HPLC (Agilent)

Three HPLCs with spectrophotometric diode array detector with different flow rate/max pressure capabilities:

- Analytic 1100 series with manual injection valve
- Micro 1100 series with autosampler

These two chromatographs are commonly operated with analytical (internal diameter 4.6mm) or narrow-bore (internal diameter 2.1mm) columns, respectively, at a maximum pressure of 400 bars.

- UHPLC 1290 with autosampler

This instrument allows operative pressure up to 1200 bars and can be employed with high efficiency columns, packed with adsorbent materials of sub-2 μ m particle dimension.

A refractive index detector can be connected with all three liquid chromatographs.

12. CALORIMETER (Tronac)

This 450 model can be used with two reaction dewars of 4 or 25 mL. It allows the direct measurement of reaction enthalpies in solution with a precision level close to micro-calories. Aqueous or hydroalcoholic solutions are titrated with an opportune reagent and absorbed or released heating during reaction is measured. If stoichiometry, reaction constants and/or reagent concentrations are known, is possible to determine single contributions of enthalpy and entropy associated with each reaction. Most recent application of this technique were in the field of metal-peptide interactions with relevant fallout in biology and pharmacology.