Title :

IMPLEMENTATION AND ACCREDITATION OF MODERN METHODS OF ANALYSIS FOR ORGANIC POLLUTANTS, USED FOR ENVIRONMENTAL EVALUATION, BY APPLICATION OF HARMONIZED EUROPEAN STANDARDS

Project: 1916/2006

- **Acronim: IAMDEM ▪**
- **Program: RENAR – Modul IV**
- **Deadline: 2007**
- **Step I : Increase of technical capabilities of laboratory by acquisition of performante equipments**

Obtained results in step I

- Acquisition of a gas chromatograph coupled with mass spectrometer having (GC MS) head-space and thermal desorption as accessories and a gas chromatograph with ECD and NPD as detectors to assure the required detection limits. For mineral oil content determination, an IR spectrometer was necessary.
- All the acquisitions were realized according Romanian legislation regarding public acquisitions: OU 30 from April 12, 2006. For acquisition of GC MS system with all accessories open auction was organized. For acquisition of IR spectrometer, contest of offers was organized.
- Also, in the first step of project, were studied the following standards that describe the analysis of organic pollutants from the environment: SR EN ISO 6468: 2000; SR EN ISO 8165-1: 2000; SR EN ISO 9377-2: 2002; SR EN ISO 10301: 2003; SR EN 11423-1: 2000; SR EN 12673: 2002; SR EN 12918: 2002; SR EN 15680: 2004; SR EN 16017: 2003; SR ISO 11046 : 1997; ISO 15009 : 2002; ISO 10382 : 2002.

FT-IR spectrometer, Perkin Elmer, Spectrum BX Model

Main characteristics and uses of FT-IR BX

Uses:

Determination of petroleum products from water;
Determination of mineral oils from soil

Characteristics:

- Optical system with a range between 7800 – 100 cm^{-1} and with resolution of 1 cm^{-1}
- Single – beam purgeable sample compartment
- Can be operate in: ratio, single – beam or interferogram mode
- System connected to a PC, which uses Spectrum software. This software enables to control the instrument and manipulate the collected spectra.

Gas-chromatograph coupled with mass spectrometer and accessories thermal desorption and headspace and gas-chromatograph with ECD and NPD detectors, Agilent Technologies

Gas-chromatograph coupled with mass spectrometer and accessories thermal desorption and headspace, Agilent Technologies

Uses:

Qualitative and quantitative analysis of organic compounds from environmental samples: organochlorine insecticides, polychlorinated biphenyls and chlorobenzenes from water; volatiles halogenated hydrobcarbons from water; clorphenols from water; organophosphorous compounds from water; volatiles organic compound from air; organochlorine pesticides and PCBs from soil.

The using of mass spectrometer as detector is necessary for identity confirmation of different compounds, even this can be analyzed with better detection limits by using other detectors as: ECD, NPD or FID.

Gas-chromatograph coupled with mass spectrometer and accessories thermal desorption and headspace, Agilent Technologies

Main characteristics:

The gas-chromatograph Agilent Technologies GC 6890N
- completely controlled by software
- programmable temperature
- electronic control of pressures and debits
- two inlets: a PTV and a Split-Splitless
- Chemstation software

Mass spectrometer Agilent Technologies 5975B VLMSD
- mass range: 3 – 1050 atomic mass units (amu)
- resolution: 1 amu
- quadrupole mass filter
- NIST spectrum library

Headspace sampler G1888 with 70 places for analysis of organic compounds from water and soil samples

Thermal desorption for analysis of air samples collected on absorbent tubes

Gas-chromatograph with ECD and NPD detectors, Agilent Technologies

Uses

Quantitative analysis of organic compounds from environmental samples: organochlorine insecticides, polychlorinated biphenyls and chlorobenzenes from water; volatiles halogenated hydrobcarbons from water; clorphenols from water; organophosphorous compounds from water; volatiles organic compound from air; organochlorine pesticides and PCBs from soil, for that the identity confirmation is made by MS detector.

Gas-chromatograph with ECD and NPD detectors, Agilent Technologies

Main characteristics:

The gas-chromatograph Agilent Technologies GC 6890N

- completely controlled by software
- programmable temperature
- electronic control of pressures and debits
- two inlets: a PTV and a Split-Splitless
- Chemstation software
- Two detectors: an electrons capture detector (ECD) used for detection of halogenated compounds and an nitrous phosphorous detector (NPD) used for detection of organophosphorous compounds.