

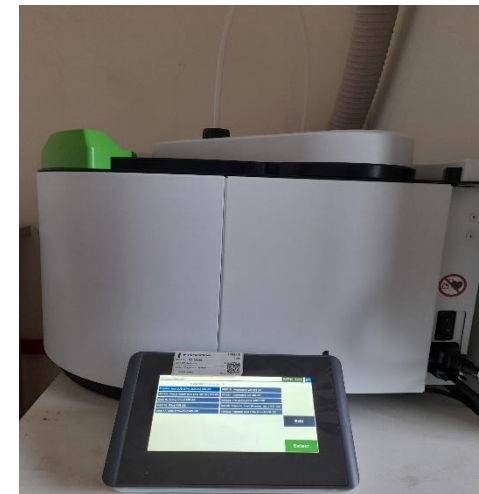
Microwave digestion system MPS 320 PekinElmer

Main functions:

- The microwave system is equipped with 16 Teflon vessels with precise temperature and pressure control.
- Provides fast and efficient acid digestion of archaeological, geological, biological samples and environmental objects.
- The digestion process is characterized with minimal acid consumption and completely eliminates the possibility of volatile element loss.

Application:

- Sample preparation for multi-element analysis by ICP-MS of any type of solid samples - glass, ceramics, archaeological and geological gold, rocks, soils, pottery, bones, bronze, biological matrices, etc.
- **Advantage** - Complete digestion of samples with high silicate content, which is not possible to be achieved by open vessel digestion.





Portable X-ray fluorescence spectrometry (p-XRF) instrument – **Titan S1, Bruker**

The equipment used for elemental analysis usually require work in a controlled laboratory environment. Many of the methods used are destructive (require the destruction of a small part of the objects to be studied).

Analysis performed using p-XRF is:

- non-destructive
- fast
- allows measurement of the concentration of elements from U to Mg in quantities from mg/kg to %
- can be performed on site (in situ), in museums, when artifacts cannot be transported to a laboratory
- allows analysis of archaeological artifacts and objects of interest for cultural and historical heritage of various types and origins.

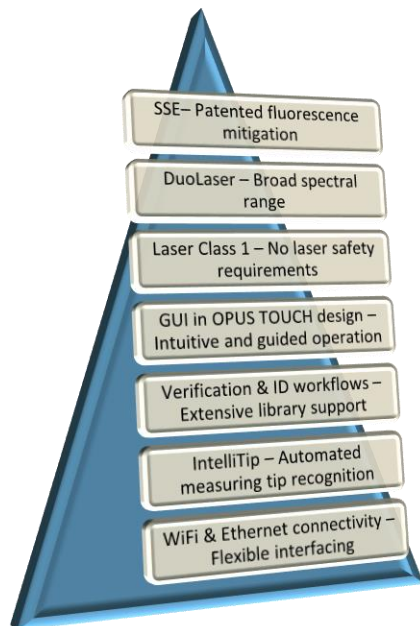


With the new p-XRF, currently analyzed are:

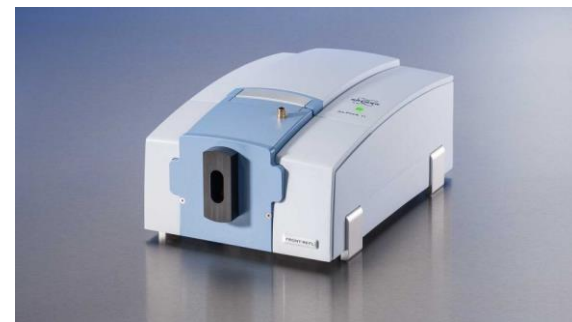
- over 200 silver coins from the funds of IM Sevlievo and IM Belogradchik
- finds of ochre (RIM Varna)
- resinous substances (bitumen) from Heraclea Sintica
- human bones (IM Radnevo)
- ceramic fragments (from various archaeological excavations)

Nondestructive and Portable Chemical Analysis of Organic and Inorganic Compounds

Raman Spectrometer Bravo, Bruker



ATR for FT-IR ALPHA II, Bruker



Compact and resilient design

Easy adaptation to all sample types

Rock Solid interferometer (lifetime >10 years)

Center Glow source (lifetime >5 years)

Diode laser (lifetime >10 years)

Tablet machine

Hydraulic pellet press, KBr

To prepare samples for XRF, FT-IR and Raman



Metallographic microscope KERN OKM-173



- Trinocular head, 30° tilt, 360° rotatable
- Eyepieces WF10x/18mm
- Magnification 50x, 100x, 200x, 500x
- Halogen light 30 W
- 3,1 MP camera, CMOS 1/2", Farbe
- Polarized light
- Possibility to take pictures

Nikon D5600 camera with 18-105 VR lens

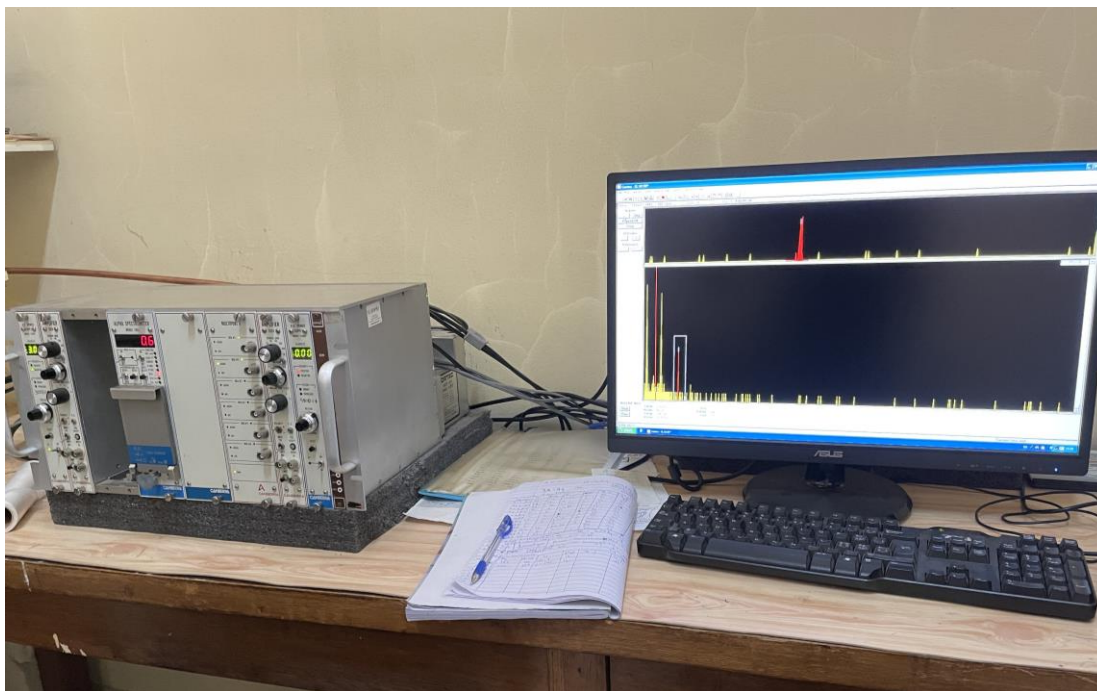
For detailed capturing of archaeological finds and samples subjected to analysis.





Radionuclide measuring device (Canberra)

Alpha spectrometer as an additional equipment for Gamma-spectrometry system



Determination of content of natural and man-made radionuclides



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Trace analysis laboratory

Hotplate for acid digestion *Stuard, CB 500*



- Ceramic top, 30x50cm,
- Accurate temperature control – max. 375°C

pH meter, *pH 80+DHS*

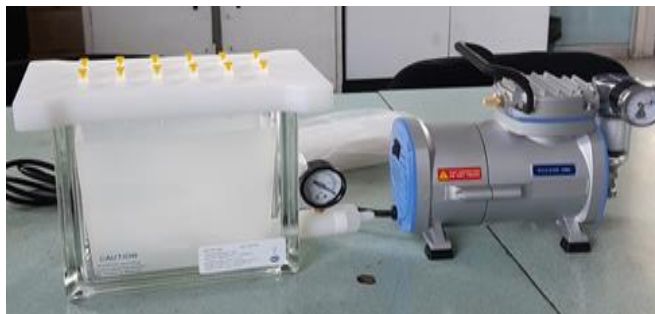


Nitrogen sample concentrator *Stuard*



- Controlled evaporation and concentration of liquid samples
- Temperature range: +5 above room temperature up to 110°C
- Homogeneity: $\pm 0.4^\circ\text{C}$
- Timer: 99.59 h

Solid-phase extraction vacuum manifold *CHROMABOND SPE*



- Evaporation and concentration of liquid samples at inert atmosphere
- Temperature: $+8^\circ\text{C}$ - 130°C
- Aluminum blocks for 36 tubes



Faculty of Chemistry and Pharmacy, SU "St. Kliment Ohridski"

Trace analysis laboratory

Vortex



Vigorous agitation of liquid samples, e.g. liquid-liquid extraction

Lyophilizer BIOBASE



- Freeze drying and concentration (-56°C) of laboratory samples.
- Ability to work with 8 round bottom flasks

Rotary vacuum evaporator *Buchi R-100, I100* controller and chemically resistant membrane vacuum pump



Digital water bath AGRO LAB WB 12



Controlled evaporation and concentration of liquid samples

Economical and rapid evaporation of a wide range of organic solvents, used in the synthesis and characterization of new materials or cleaning of archaeological finds.