

Equipment for recovery of boil-off helium gas from the NMR spectrometers at the Bulgarian NMR (BuNMR) Centre at IOCCP

Heliosmart Recovery system (Bruker Biospin GmbH) new unique equipment for Bulgaria, funded under the contract, Д01-172/2022 with Ministry of education and science of Bulgaria

Characteristics

- Gas bag volume: 400 l
- Compressor speed: 40 l/min
- Electronic control
- Operating pressure: 200 bar
- Recovery of ~85% of the boil-off helium gas

Capacity of BuNMR

- 4 NMR spectrometers
- Total compressed gas volume: 3x50 l cylinders/200 bar (~28 m³ for 1 month)



- Bruker Heliosmart Recovery system collects the boil-off helium gas from the NMR magnets and compresses it for storage in high pressure helium gas cylinders.
- The system is equipped with internal gas bag and a three-stage high pressure compressor
- Possibility of regenerating the expensive liquid helium needed for the operation of NMR spectrometers

FLUORESCENCE MICROSCOPE LEICA DM2000 LED WITH COLOR DIGITAL CAMERA AND MICROSCOPE IMAGING SOFTWARE

Illumination techniques:

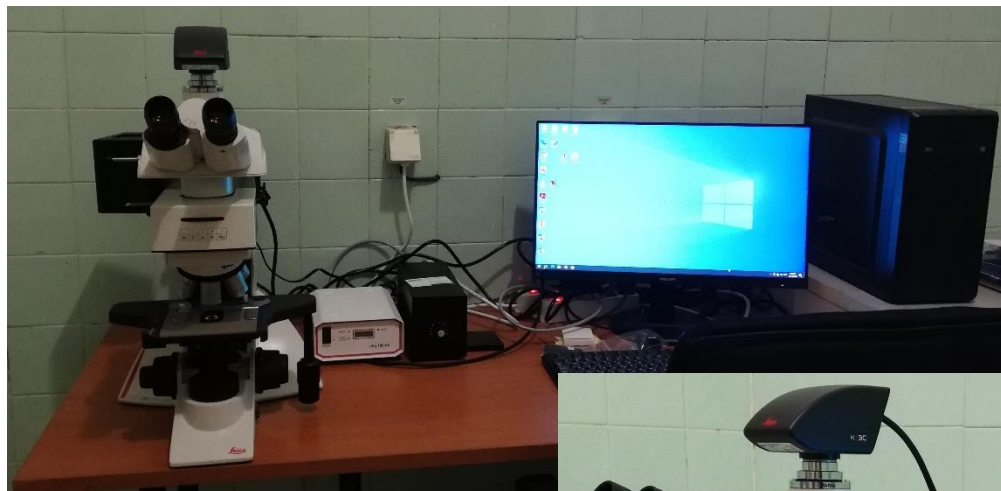
- Bright field for incident and reflected light;
- Fluorescence (autofluorescence and upon fluorescent dye staining);
- Phase contrast;
- Dark field;
- Light polarization;

Applicable for analysis of:

Fluorescent organic materials of natural and synthetic origin, biological materials, varnishes, dyes and pigments, textile fibers etc.

Nontransparent (opaque or/and thick) materials such as powder samples of plasters, pigments, paint flakes, etc.

More reliable identification and characterization of pigments, dyes, fibers, organic and biological materials by light polarization



Equipped with the following objectives:

- 5x, aperture 0.12;
- 10x, aperture 0.25, for incident and reflected light;
- 20x, aperture 0.40, for incident and reflected light;
- 40x, aperture 0.65, applicable for phase contrast;
- 63x, aperture 0.80;
- 100x, aperture 1.25, immersion, applicable for phase contrast;



and fluorescence filters: UV (excitation 340-380 nm, emission LP 425 nm), blue (excitation 450-490 nm, excitation LP 515 nm), green (excitation 515-560 nm, excitation LP 590 nm)

FTIR spectrometer Bruker INVENIO R



Applicable to all **materials**:

- solid
- liquid
- gaseous



Covers the full
spectral range
from far, mid and
near infrared to
VIS/UV

Available with
spectral
resolution < 0.085
 cm^{-1}

Measure > 70
spectra per second
 16cm^{-1} resolution
with Rapid-scan

FTIR spectrometer Bruker Tenzor 27

❖ Additional equipment



Change of laser
source

Adjustments and
setups

Change of
computer
components and
UPS