ostec
company group

future's
in the making

FTIR spectrometers and microscopes IROS

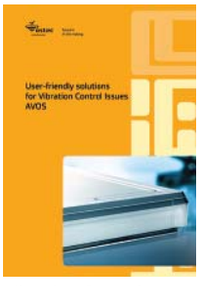
Ostec Corporate Group produces and offers hi-tech innovative scientific and analytical equipment.

Our mission is to be a company that finds, selects, protects and develops cutting-edge ideas to create new products and technologies and deliver technological progress. That is why the symbol of our company is a growing sprout.

We provide complete solutions for our clients: the best equipment to meet customer's requirements, deep knowledge of customer's applications, qualified and reliable maintenance support.

ostec

OUR other products:



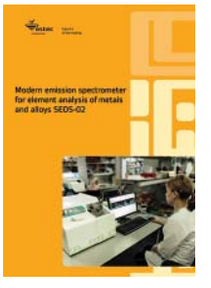
Vibration Control Solutions AVOS

Optical components OCOS

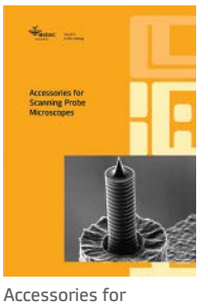
Confocal Raman Microscope RAMOS

Nanomechanical Testers NIOS

Light Measuring, Elemental Analysis and Nanoscale Microscopy Instrument LIOS

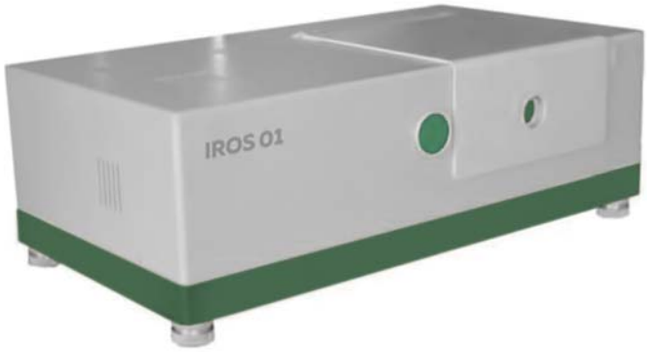


Emission Spectrometer SEOS-02



Accessories for Scanning Probe Microscopes

OSTEC company offers a wide range of FTIR instruments



IROS 01

IROS M

AT01MP

AT045R

AT02F

AT02MP

AT01PZ

AT03MP

AT01L

AT01F

AT015R

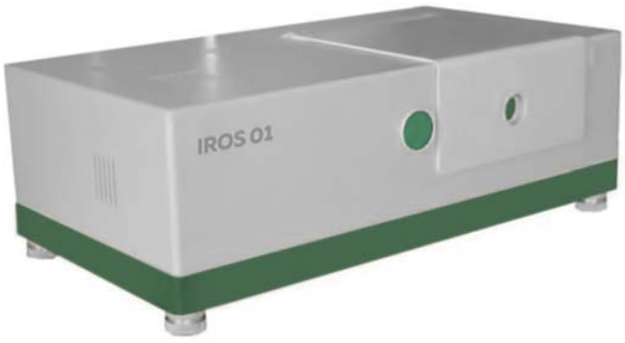
We offer instruments with unmatched performance

- More than 25 years of FTIR spectrometers production
- The best price-performance ratio
- Wide range of own-produced accessories
- Great experience in non-standard and customized systems design to meet customers requirements
- Collaborative developments with leading research institutes of Russian Academy of Sciences (RAS)
- Leading positions in FTIR instrumentation market in Russia

Our key customers

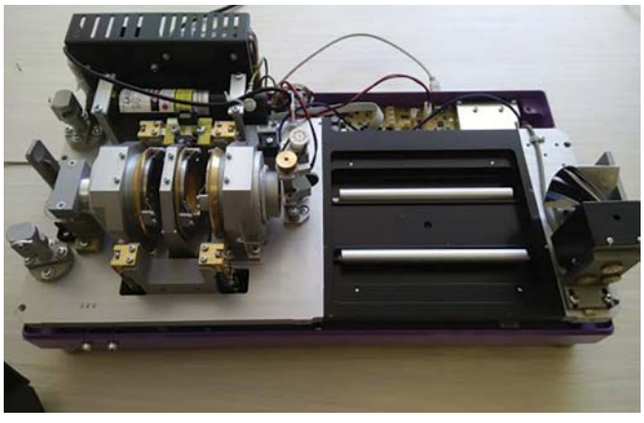
- Law enforcement agencies expert criminalistics divisions of the Russian Federation
- Forensic examination laboratories under the Ministry of Justice of the Russian Federation
- Central Expert Criminalistic Customs Directorate branches of the Russian Federation
- Federal Service for Drug Control subdivisions
- Scientific research institutes of RAS
- Chemical and pharmacological plants

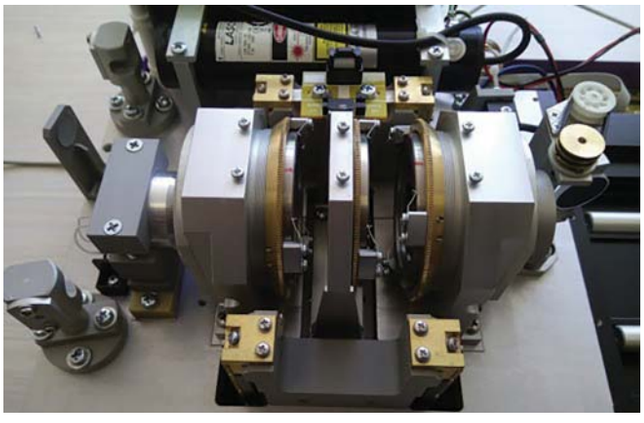
IROS 01 FTIR spectrometer



- Resistance to disaligment
- Spectral range: 470 – 5700 cm^{-1} (with ZnSe beamsplitter and Ge photodetector window)
- Optional 470 – 8500 cm^{-1} (with DLaTGS photodetector)
- Optional 350 – 7900 cm^{-1} (with KBr beamsplitter and photodetector window)
- Min. resolution: 0.5 cm^{-1}
- Signal-to-noise ratio: ≥40 000 (1 min, resolution 4 cm^{-1}, range 2000 - 2200 cm^{-1})
- Great variety of own-produced attached modules
- Control electronics with USB interface and self-test device
- Fourier spectrometer weight (without attachments): ≤16 kg
- Dimensions: 550 x 300 x 200 mm
- External optical output for connecting devices installed outside the cuvette compartment

Our products



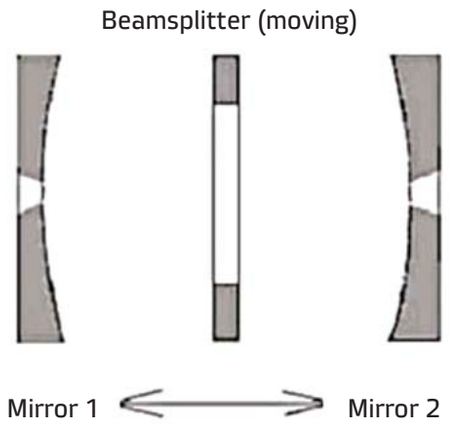


IROS FTIR spectrometers include unique “double cat’s eye” interferometer patented in 1993.

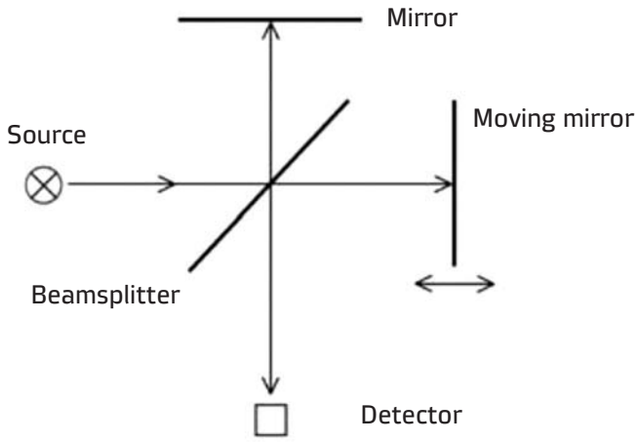
Advantages over classical Michelson interferometer:

- Resistance to misalignment. There is no need to compensate thermal drifts and vibrations misalignments
- High beamsplitter resolution
- Angle of incidence for beamsplitter is 90º. It allows to avoid polarization effects, angle of incidence for Michelson interferometers is 45º or 30º

Interferometers optical schemes

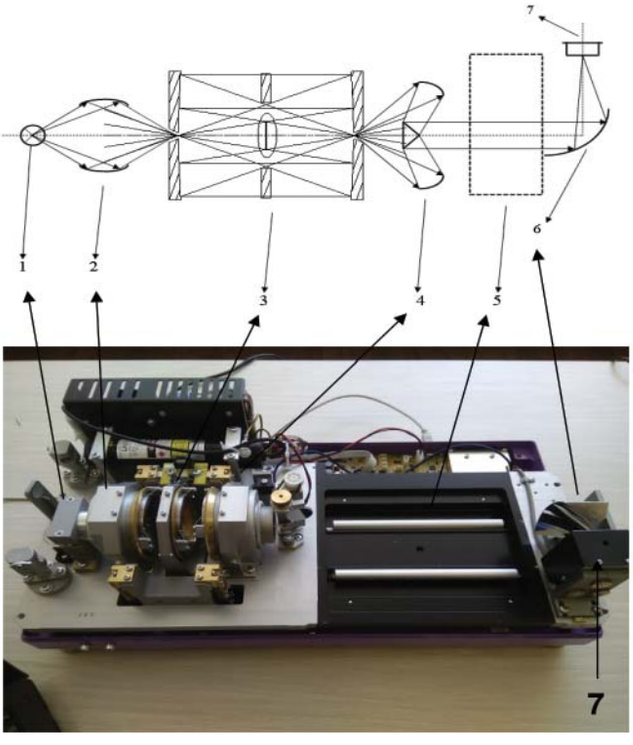


"Double cat's eye"interferometer optical scheme



Michelson interferometer optical scheme

Interferometer construction



Interferometer construction reliability and small size allow to use spectrometer as a mobile analytical station.

1	IR radiation source
2	Input optical focusing system
3	Interferometer
4	Parallel beam converting mirrors
5	Cuvette compartment
6	Parabolic mirror
7	Photodetector

IROS M2 wide-range IR microscope

IROS M2 wide-range IR microscope combined with IROS 01 FTIR spectrometer.

Spectrum registration modes:

- Transmission
- Reflection (Specular and ATR)

Min. linear sample size: 5-10 μm

Two built-in detectors:

- MCT with nitrogen cooling
- MG-32M (DLaTGS analog)

Simultaneous spectrum registration and sample monitoring.

Main characteristics:

- Spectra registration of micro-objects up to 10 μm in transmission, specular reflection and ATR (with suitable objectives) modes
- Spectral range: 600 – 6 000 cm^{-1} (with MST detector)
- Min. resolution: 0.5 cm^{-1}
- Signal-to-noise ratio: ≥12 000 (1 min, resolution 4 cm^{-1}, range 2000 – 2200 cm^{-1})
- Revolver mechanism with changeable lenses
- IR objective 15x
- Visual objective 4x (10x optional)
- ATR (attenuated total reflection) objective 36x or 60x (available on request)
- Highly sensitive MCT detector with liquid nitrogen cooling
- Additional MG32 detector (DLaTGS analog) for operation without liquid nitrogen
- Simultaneous operation in IR spectra registration mode and visual sample observation mode
- Adjustable and rectangular diaphragms to identify IR spectrum registration area
- Built-in video camera (2 mpx, USB)

IROS M3 wide-range IR microscope

Microscope is mounted outside the cuvette compartment close to spectrometer. Visual channel is overlaying with IR channel for sample observation (aiming) and IR spectrum registration.

Revolver mechanism allows to combine several special objectives:

- ATR objective
- IR objective
- Visual objective

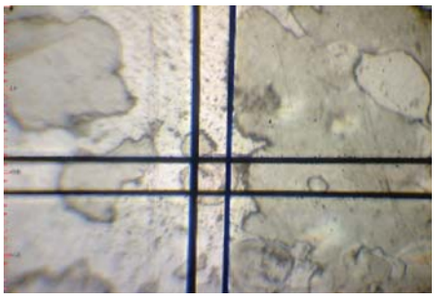
For sample observation there are eyepieces and built-in video camera installed.

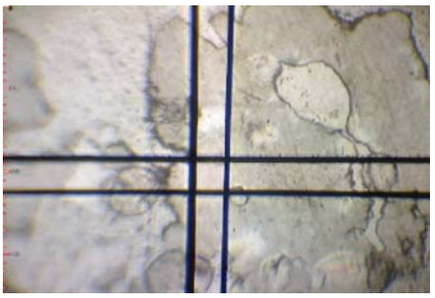
Two detectors are installed at the same time:

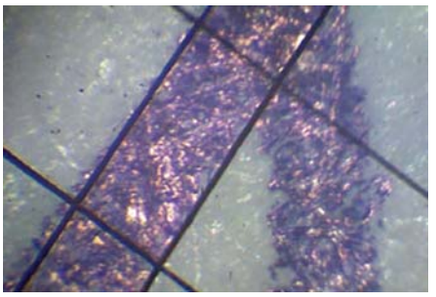
- Highly sensitive MCT with liquid nitrogen cooling
- Pyroelectric (cooling is not required)

Main characteristics:

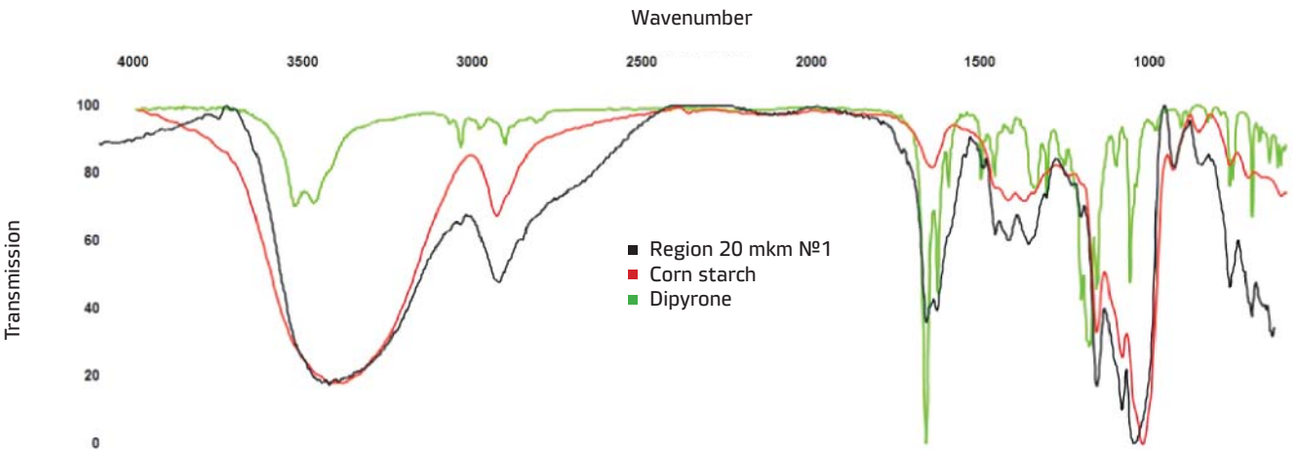
- Spectra registration of micro-objects up to 5 μm in transmission, specular reflection and ATR (with suitable objectives) modes
- Spectral range: 600 – 6000 cm^{-1} (with MCT detector)
- Min. resolution: 0.5 cm^{-1}
- Signal-to-noise ratio: ≥20 000 (1 min, resolution 4 cm^{-1}, range 2000 – 2200 cm^{-1})
- Motorized sample stage with autofocus system and mapping mode according to programmed parameters. Step: 2.5 μm
- Revolver mechanism with changeable lenses
- IR objective 15x
- Visual objectives 4x, 10x, 36x or 60x
- ATR objective 36x or 60x
- Highly sensitive MCT detector with liquid nitrogen cooling
- Additional MG32 detector (DLaTGS analog) for operation without liquid nitrogen
- Simultaneous operation in IR spectra registration mode and visual sample observation mode
- Adjustable and rectangular diaphragms to identify IR spectrum registration area
- Built-in video camera (2 mpx, USB)



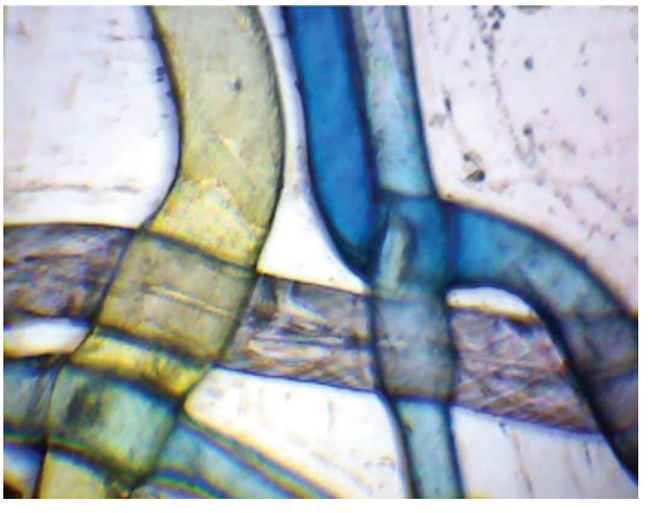




Rectangular and iris diaphragms allow to select IR spectrum registration area. Rectangular diaphragms made of special glass opaque in wide IR range are the most convenient.



IROS M2 and IROS M3 IR microscopes allow to register spectrum from 10 μm and 5 μm samples respectively.



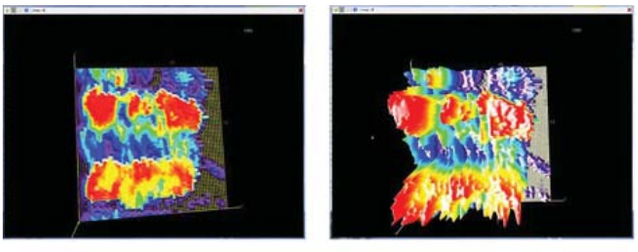
IROS M2 IR microscope combined with IROS 01 FTIR spectrometer:

- Simultaneous spectrum registration and sample observation with built-in video camera
- High-precision spectrum measurements of polymer particles, fibers, powder mixtures, inscription on paper fragments
- IR spectra registration without sample preparation

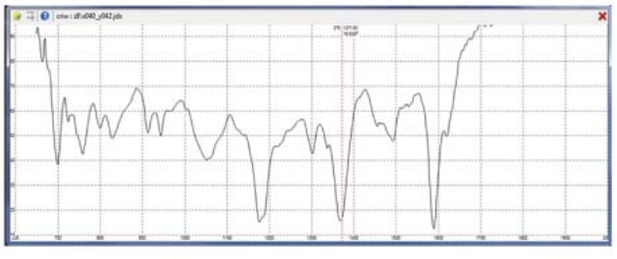
IROS M3 IR microscope is high-end instrument with set of additional functions:

- 4x interchangeable objectives
- Advanced built-in control panel
- Automatic mapping system (motorized sample stage with autofocus system)
- Special software for microscope control and results processing

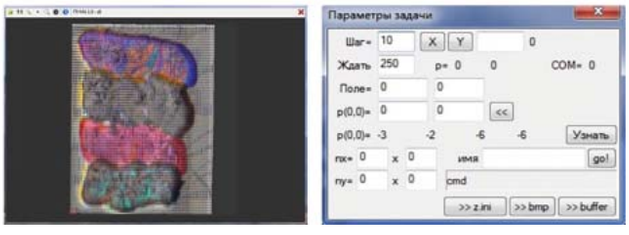
Built-in control panel allows to manage spectra registration process, photometric area observatiion (using binocular), quick sample change, sample stage manipulation and brightness illumination adjustment simultaneously.



Motorized sample stage with autofocus system allows to receive sample spectrum map in automatic mode.



IR spectrum of office marker pens strokes with various chemical composition.



"Spectral map" shows impurities concentration at different points of sample in the form of relief or color gradations.

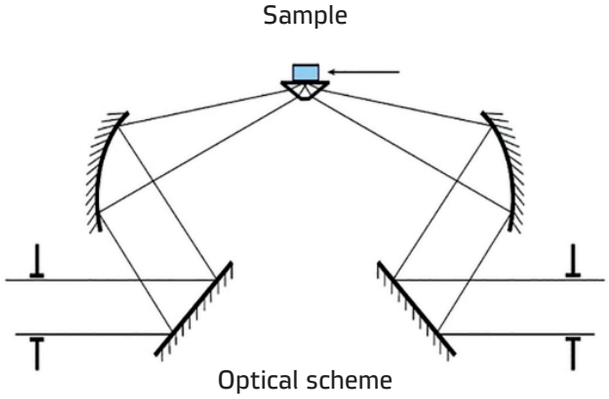
AT01MP – multi-purpose ATR/SDR attached module with diamond prism and integrated visualization system

Main advantages:

- Preliminary sample preparation is not needed for the most cases
- Built-in video camera allows to register spectrum and observe sample (with video capturing) simultaneously
- Spectra registration both in ATR mode and in specular/diffuse reflection mode
- Quick operating mode changing, quick ATR prism replacing

Sample types:

- Liquids of any viscosity grade (solutions, suspensions, oils)
- Powder-like samples
- Polymer films
- Fibers
- Solid and elastic samples up to 0.25 mm2 (paint and varnish coatings fragments, polymer particles)



Optical scheme

Main characteristics:

- Input light transmission (in operating spectral range): ≥10%
- Prism material: ZnSe (Ge or diamond on request)
- Crystal working surface: 4 x 2.3 mm
- Solid sample min. size: 0.5 x 0.5 mm
- Liquid sample min. volume:1 µl
- Sample angle of incidence: 45º
- Digital video camera resolution: 1600 x 1200
- Total optical magnification: 75x

Diamond, ZnSe and Ge prisms are available Holders with prisms can be easily replaced by the operator.

Prism material	Light penetration depth (45ºC)				Refractive index for 1000 cm^{-1}
	4000 cm^{-1}	2000 cm^{-1}	41000 cm^{-1}	400 cm^{-1}	
Diamond	0.5	1	2	5	2.4
ZnSe	0.5	1	2	5	2.4
Ge	0.17	0.33	0.66	1.7	4

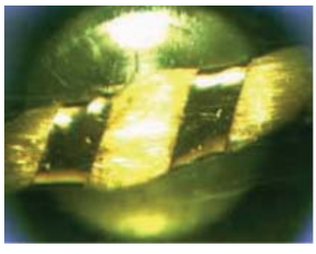
Excess interaction between sample and prism can damage prism. Clamping device has tightness degree indicator to adjust contact pressure.

AT02MP – multi-purpose ATR and specular reflection attached module

Multi-purpose instrument for IR spectra registration both in ATR mode and specular/diffuse reflection modes.

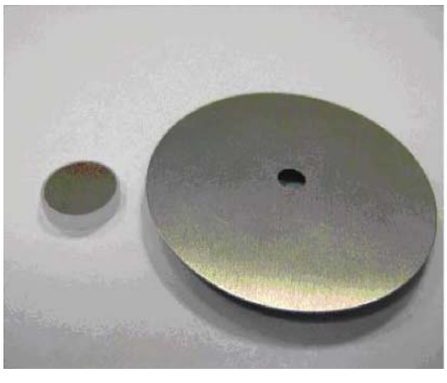
Built-in video camera allows to monitor sample (with video capturing) and to register spectrum simultaneously.

On-line video monitoring allows to choose and set point on sample surface for IR spectrum registering.



Holder with diamond prism

Holder with ZnSe prism



Specular-diffuse reflection flange

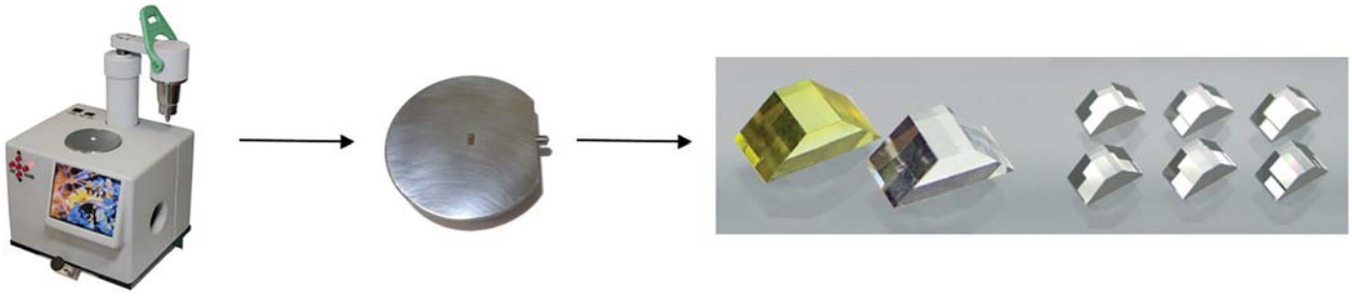
AT01MP can operate with Diamond, ZnSe and Ge prisms.

Holders with prisms can be easily replaced by the operator.

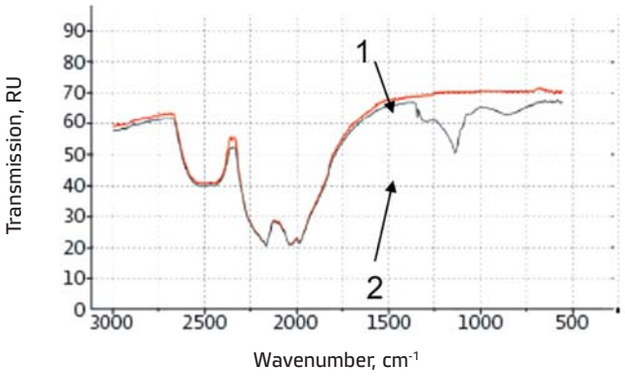
Input light transmission (in operating spectral range) ≥10% for diamond prism, ≥25% for Ge and ZnSe prism.

AT02MP – multi-purpose ATR and specular reflection attached module

Diamond crystals for ATxxMP multi-purpose ATR modules are grown by one institute of Russian Academy of Science. Unique growing technology allows to obtain crystals up to 6 carats with specified properties.



Single-crystal diamonds with the lowest light absorption in IR region are used for ATR elements.



1 IR spectrum of colorless diamond

2 IR spectrum of light yellow crystal

AT03MP – multi-purpose diamond thermocell with temperature controller

Sample heating system with ATR attached module. Diamond crystal allows to register IR spectra of chemically aggressive compounds, acids, alkalis and hard, abrasive materials.

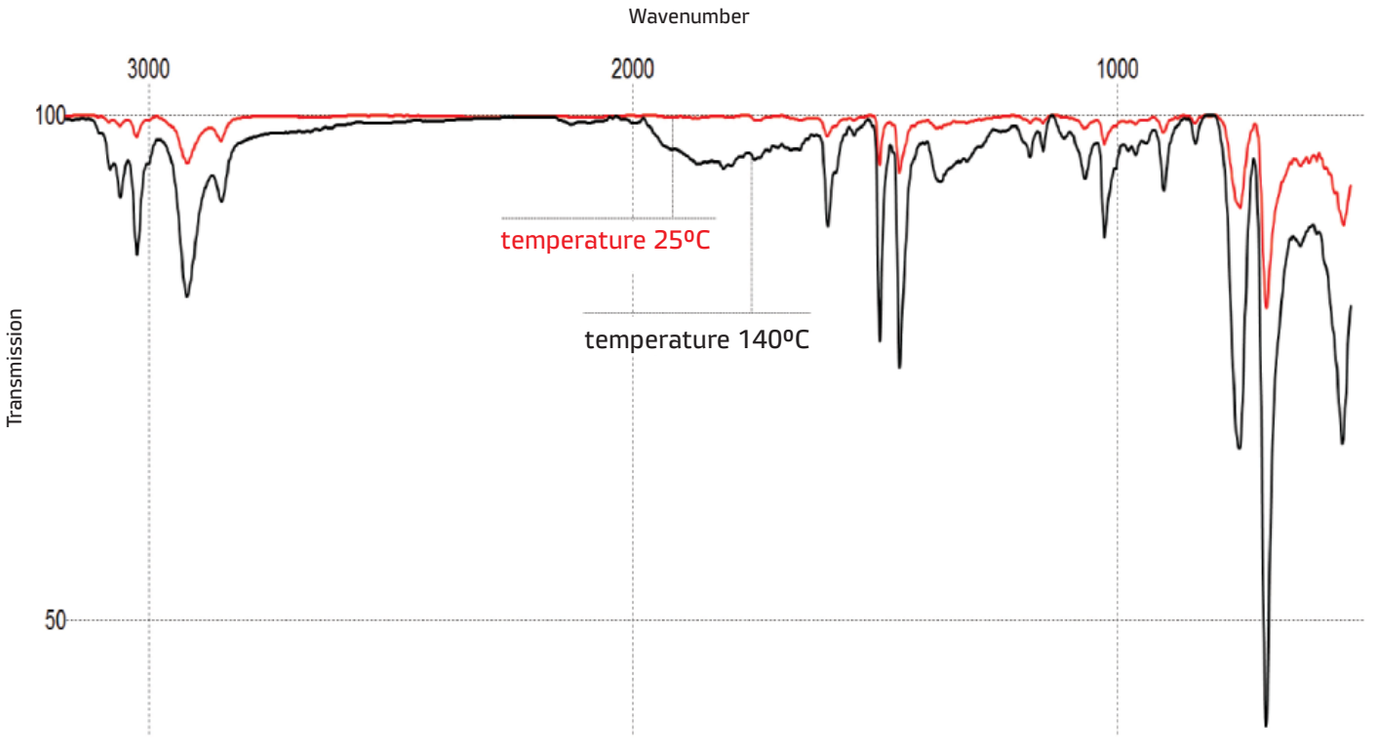
Main characteristics:

- Input light transmission (in operating spectral range): ≥10%
- Max. controlled sample temperature: 220ºC
- Temperature adjustment accuracy: 1ºC
- Time to peak temperature: ≤15 min (usually 10 min)
- Dimensions: 200 x 130 x 90 mm

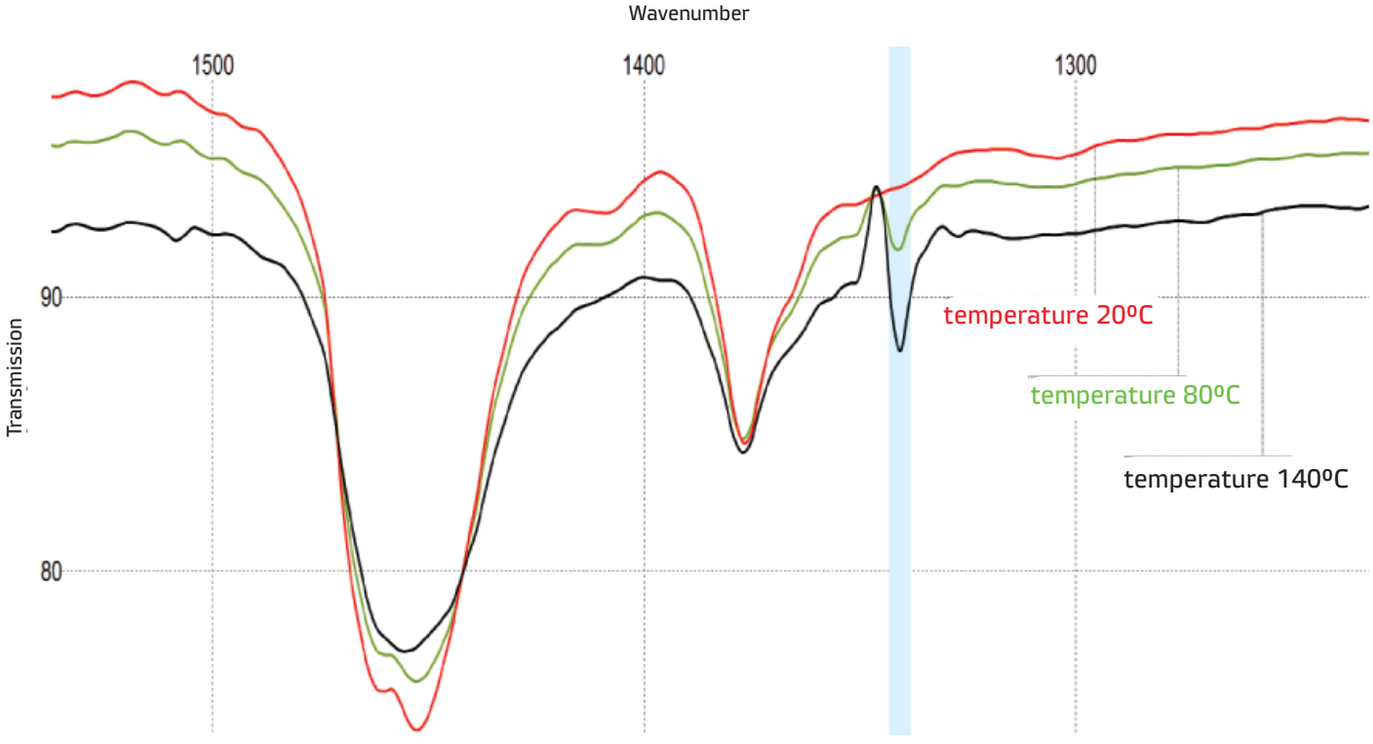
Application:

- Polymer compounds thermal stability study
- Polymers curing kinetics investigation

Spectra of polymer at room temperature (red) and at 140ºC (black)



Heated solid samples spectra are defined more accurately than the cold ones. Solid sample heating helps to increase method sensitivity.



New line of lubricant spectrum (1340 cm^{-1}) appears when the sample is heated. Spectra at room temperature (red), at 80ºC (green) and at 140ºC (black).

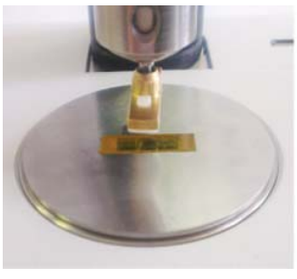
AT01M – attached module for multiple ATR mode

Sample types:

- Liquids of any viscosity grade (solutions, suspensions, oils)
- Solid and elastic samples
- Powder-like samples
- Thin films (such as PP, PE and precipitated from solution)
- Fibers

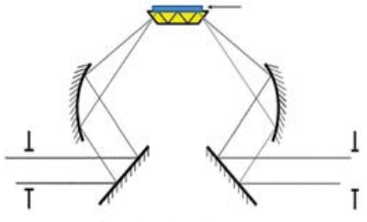
Main advantages:

- Spectra registration of samples with dimensions smaller than prism working distance
- Ability to rotate clamping device by 90º
- Sample video control (only with ZnSe prism)

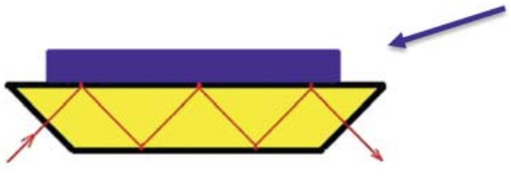


ZnSe prism can be destroyed by acids and alkalis. Sample pH should be 5-9.
For chemically aggressive samples Ge prism should be used (GE01M order code is available on request).

Sample



Optical scheme



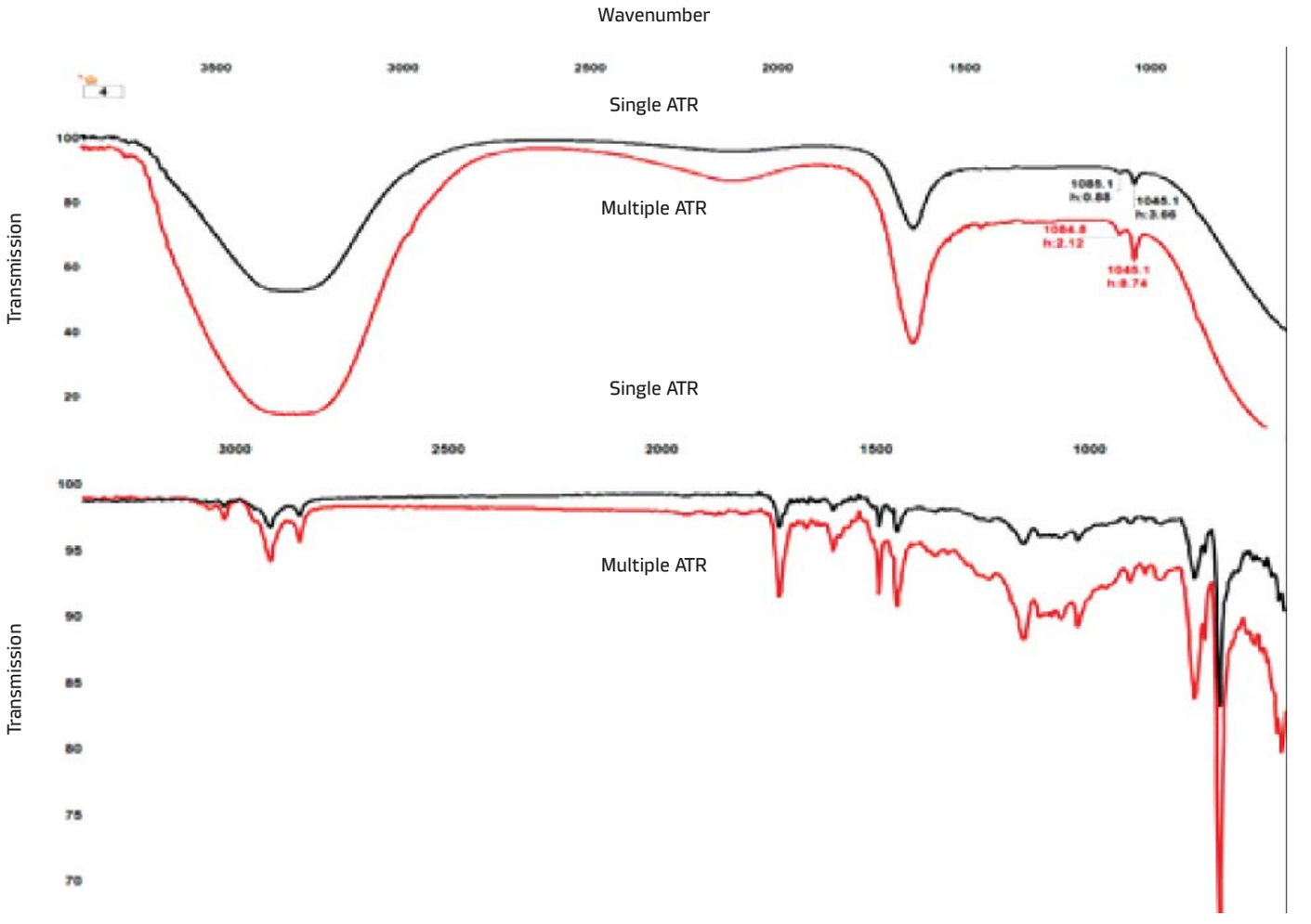
Clamping device

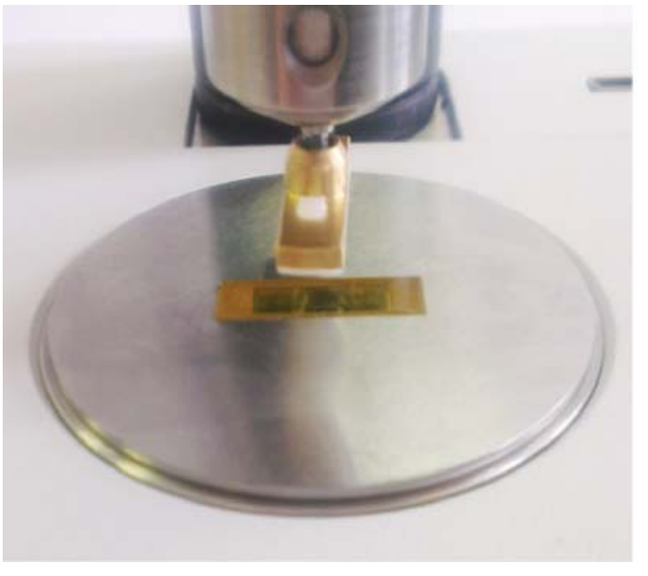
Excess interaction between the sample and the prism can cause prism damage.

Clamping device has a tightness degree indicator to adjust contact pressure.

Main characteristics:

- Input light transmission (in operating spectral range): ≥25%
- Prism material: ZnSe or Ge (steel 10X17H13M2T frame optional)
- Light penetration depth: 5-15 μm
- Reflection number: 3x
- Prism working surface: 21 x 6 mm
- Micro-objective magnification: 4x
- Total vision channel magnification: 75x
- Digital video camera resolution: 640 x 480





To register their spectra small size objects should be pressed to the prism center (by expanding tip to 90º).

Comparison of single and multiple broken total internal reflection spectra for ethanol (upper diagram) and laser printer toner (lower diagram).

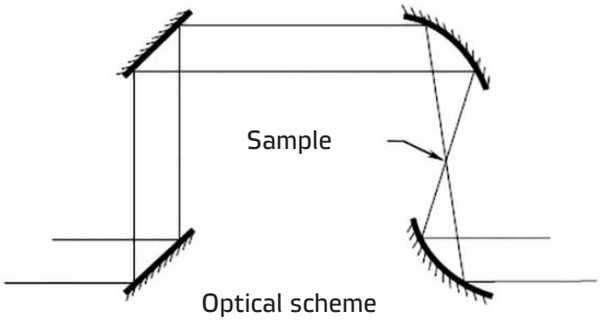
AT02F – focusing attached module with adjustable stage and horizontal sample installation

Main advantages:

- Horizontal sample installation
- Simple sample preparation
- Arbitrary form of samples
- Condenser optics
- Min. sample diameter: 1 mm
- Liquid samples

Sample types:

- KBr medications of any powdery paint coating fragments (pharmacological preparations, fragments of paint coatings, etc.)
- Manual or hydraulic press is available on request
- Liquid and pasty of samples on KBr, ZnSe or Si gemstones
- Solid samples with arbitrary shape (precious stones, optical parts, semiconductor materials)
- Polymer films (polyethylene, PET, polycarbonate, acrylates, etc.) including precipitated from solutions



Optical scheme

IR spectrometer beam is condensing on the sample by a parabolic mirror.

Beam diameter is 3 mm.

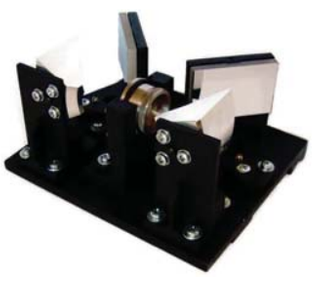
Input light transmission (diaphragm 3 mm): ≥65%.

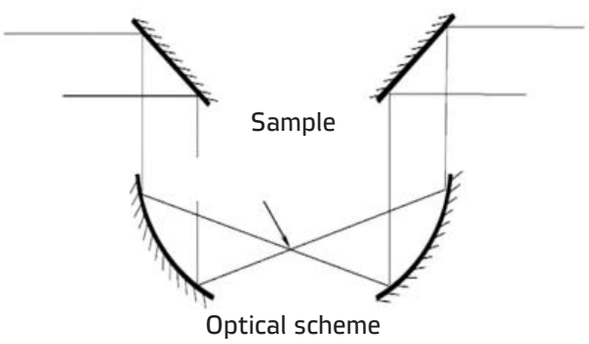
Complete set includes:

- Apertures 1, 2 and 3 mm in diameter
- Microtablets and windows-substrates
- ZnSe and Si windows

ZnSe glasses can be destroyed by acids and alkalis. Sample pH should be 5-9. For chemically aggressive samples use Si windows.

AT01F – focusing attached module with parabolic optics





Optical scheme

Main advantages:

- Parabolic condenser optics
- Small samples (1x1 mm) transmission spectra registration

Sample types:

- KBr tablets of any powdery samples (pharmacological medications, fragments of paint coating fragments, etc.)
- Manual or hydraulic press is available on request
- Liquid and pasty samples on KBr, ZnSe or Si glasses
- Polymer films (polyethylene, PET, polycarbonate, acrylates, etc.) including precipitated from solutions

Main characteristics:

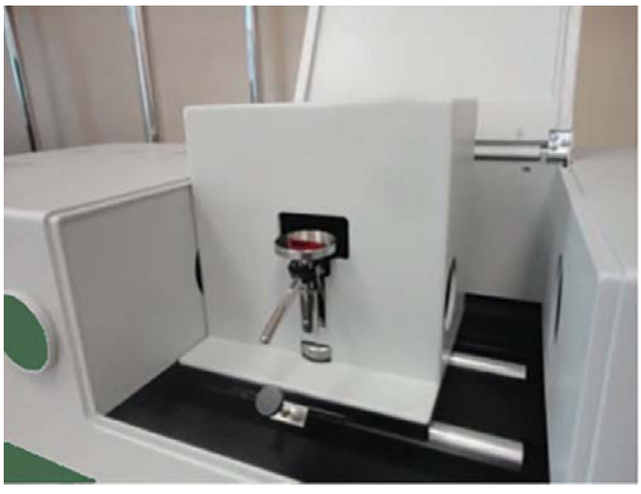
- Input light transmission (in operating spectral range): focal spot
- IR focusing spot diameter: 3 mm
- Min. solid sample plane dimensions: 1 x 1 mm
- Min. test fluid volume: 1 µl

Complete set includes:

- Microtablets holder
- Windows and substrates clip
- ZnSe and Si windows

Attached module operates with compressed tablets 3.5 mm in diameter. Manual or hydraulic press should be used for tablets preparation.

AT01PZ – specular reflection attached module with 45º beam angle of incidence, lower sample installation and integrated imaging system

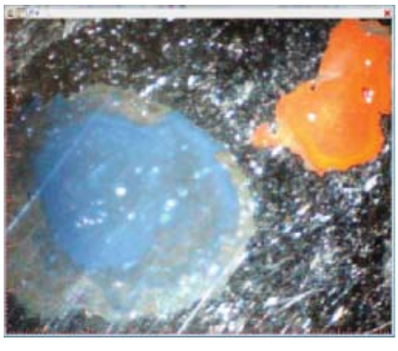


Main advantages:

- Sample horizontal installation
- Built-in visualization system
- Simple sample preparation
- Arbitrary form of samples
- Condenser optics
- Sample dimensions from 2 to 30 mm
- Liquid samples analysis

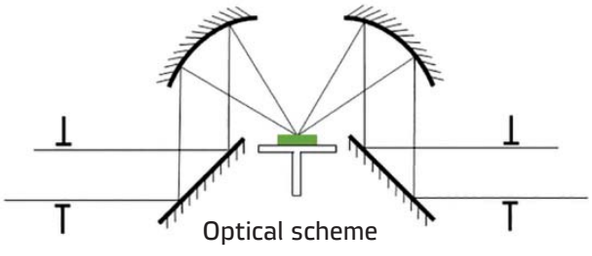
Sample types:

- Bulk materials in form of powders and granules
- Liquid and pasty of samples
- Solid gemstones with arbitrary shape (precious stones, optical parts, semiconductor materials)
- Polymer films and solid polymers



Main characteristics:

- Input light transmission (in operating spectral range): focal spot
- IR focusing spot diameter: 3 mm
- Angle of incidence on sample (for central beam): 45º
- Max. solid sample plane dimensions: 30 x 30 mm
- Max. solid sample height: 13 mm



Optical scheme

Complete set includes:

- Support mirror
- Cell for bulk materials
- Solid samples holders 12 and 30 mm in diameter

Powdery or elastic sample should be rolled on a metal plate to form thin film. This sample preparation significantly increase spectrum signal.

Roller or mini-press is available on request.

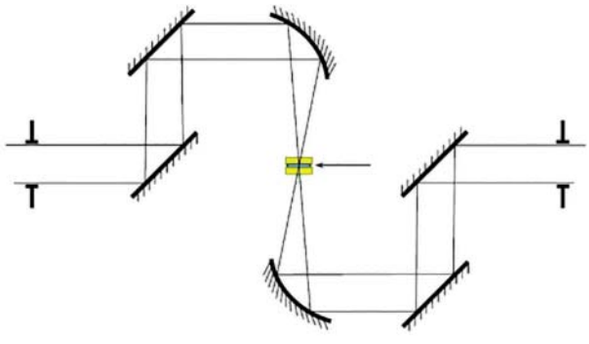
AT01L – focusing attached module with liquid cell and adjustable layer thickness

Main advantages:

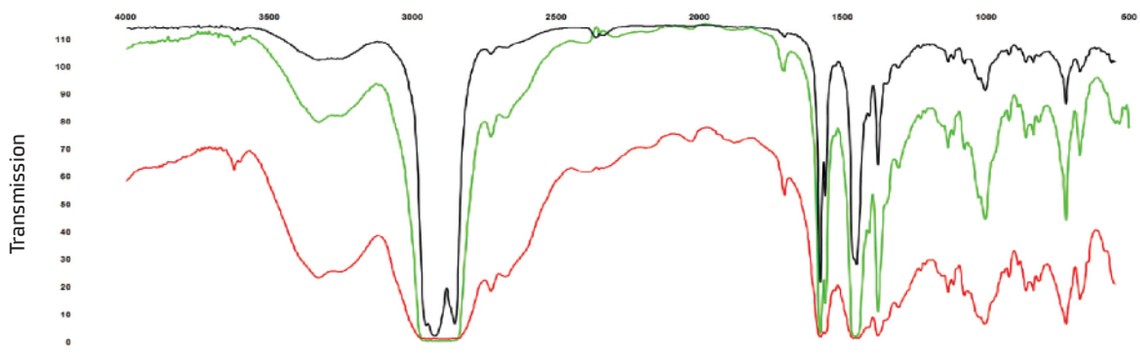
- Liquids of any viscosity grade analysis
- Line not require long sample preparation
- On-Line layer thickness control

Substrates with ZnSe windows allow to register spectra of samples with water content.

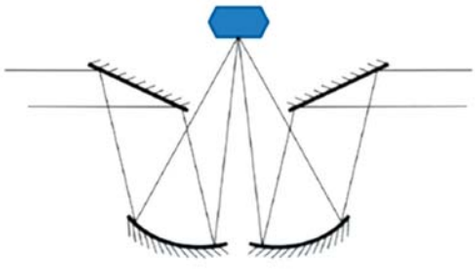
On-line sample layer thickness control allows to choose optimal layer thickness to increase IR spectra signal.



Optical scheme



AT015R – specular and diffuse reflection attached module with 15º angle of incidence and upper sample installation



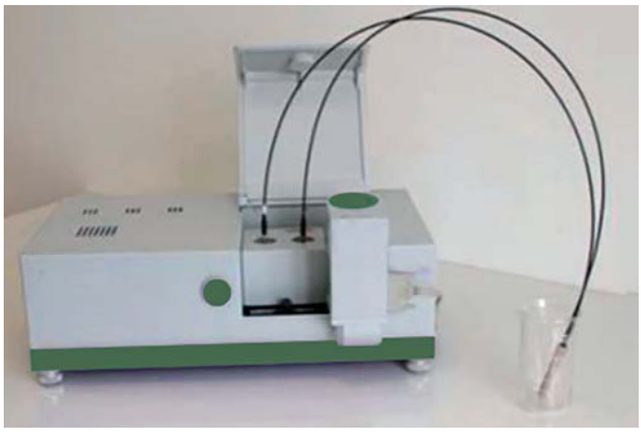
Sample types:

- Optical and semiconductor materials
- Gemstones
- Precious and semiprecious stones
- Thin films on hard of surfaces
- Polymer samples with arbitrary shape

Main characteristics:

- Input light transmission (in operating spectral range, with focal diaphragm): ≥50%
- IR focusing spot diameter: 3 mm
- Angle of incidence on sample (for central beam): 15º
- Large diaphragm diameter: 5 mm
- Small diaphragm diameter: 2 mm

AT015R – specular and diffuse reflection attached module with 15º incidence angle and upper sample installation



Main advantages:

- High scanning speed
- High sensitivity
- Ideal solution for gas analysis

Designed for applications with extremely low IR spectra intensity:

- LED IR probes
- Low gas concentration in multi-pass gas cuvette
- Distant and low power light sources
- Other cases requiring high sensitivity for IR signals

Main characteristics:

- Time for 50 scans spectrum registration (resolution 4 cm^{-1}): 20 seconds
- Photodetector receiving area: 1 mm x 1 mm
- Cryostat capacity: 200 ml
- Operating time after cryostat filling: 6 hours

FTIR spectrometers based on Michelson interferometer

Michelson interferometer with self-compensation, no dynamic adjustment needed.

Radiation source – nichrome-ceramics / halogen lamp.

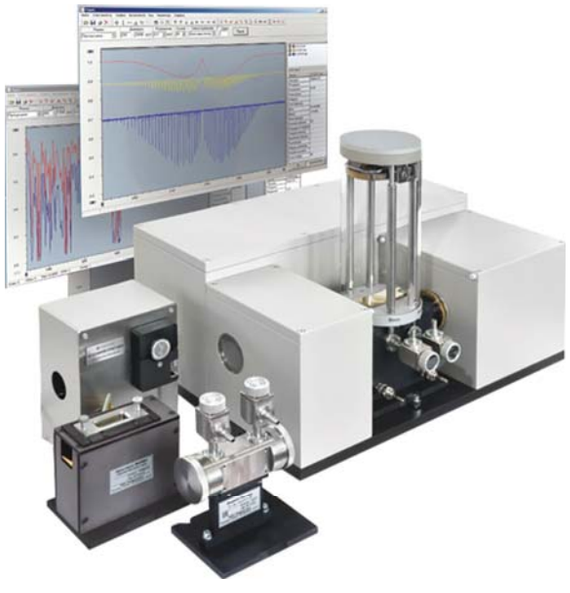
Beamsplitter – KBr/Ge / CaF2/Ge, optical windows and beamsplitter moisture-proof coating.

Detector – pyroelectric DLaTGS detector / InGaAs or Si photodiodes.

Internal calibration – He-Ne laser.

Purge system – CDA or nitrogen for CO2 and H2O vapour noise minimization.

Recording system – 24-bit A/D converter with amplifiers and antinoise filters.



Main characteristics:

- Spectrometers product range with resolution up to 0,1 cm^{-1}
- High sensitivity, rapid response
- Automated measurements, easy to use
- Wide range of accessories
- Application software for common tasks

FTIR spectrometers specifications

Product	P01	P02	P03	P11
Spectral range, cm^{-1}	370-7800	370-7800	370-7800	3700-12500
Spectral resolution, cm^{-1}	1.0	0.5	0.12	2.0
Signal-to-noise ratio	> 60 000			
Beamsplitter	KBr with multi-layer Ge-based coating			CaF_2 with Ge coating
Radiation source	High temperature ceramic metal			Halogen lamp
Detector	Pyroelectric DLaTGS detector			InGaAs, Si photodiodes
Cell compartment dimensions, mm	200x190x170			
Spectrometer dimensions, mm	520x370x250		520x490x250	520x370x250

Multi-purpose lab IROS P01 and IROS P02 FTIR spectrometers are designed for routine measurements and scientific research in the mid-IR spectrum.

IROS P01 and IROS P02 are basic models for scientific, testing and analytical laboratories. These spectrometers have high signal-to-noise ratio, spectral resolution 1.0/0.5 cm^{-1}, large cell compartment.

IROS P01 based FTIR spectrometers for fuel analysis

On-line quality control: oxygenates and benzol detection in petrol and aviation fuel.

Analyzer root principle:

- Analyzed probe spectrum comparison to the calibration
- mixture (of known oxygenates and benzol content in petrol) spectrum
- Rapid analysis: one probe < 2 min
- Analyzer is factory calibrated in accordance with ASTM E1655
- For calibration verification samples prepared in accordance with ASTM D4307 are used

Oxygenates measurement range and accuracy in accordance with ASTM D5845

Analyte	Measurement range, w/w, %	Standard deviation, %
MTBE	0.1 – 20	0.9
ETBE	0.1 – 20	0.75
TAME	0.1 – 20	1.2
DIPE	0.1 – 20	0.6
Methanol	0.1 – 6.0	0.25
Ethanol	0.1 – 11	0.4
TBA	0.1 – 14	0.55
Propanol	0.1 – 10	0.5
IPA	0.1 – 10	0.5
MMA	0.1 – 5.0	0.3

Oxygenates and benzol detection in petrol:

IR spectra analysis is performed via multi-dimensional least-squares method of APetro software.

Software IROS PAPetro controls measurement process:

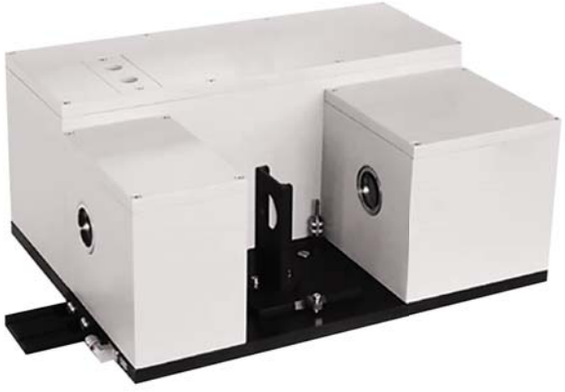
- Petrol probe injection through autosampler with integrated peristaltic pump
- Automatic basic IR spectrum detection using comparison sample in a separate cell
- Flow-cell sample and solvent rinse
- IR spectra registration and mathematical treatment
- Report preparation and data backup
- Analysis results printoutput

IROS P01 IR spectrometer for electrical insulating mineral oil monitoring

ASTM D2668 - 07(2013)
Standard Test Method for 2,6-di-tert-Butyl-p-Cresol and 2,6-di-tert-Butyl Phenol in Electrical Insulating Oil by Infrared Absorption.

Liquid cell should be chosen depending on a task and probe properties. It can be demountable or one-piece, with proper optical path length and window material clear in the needed spectral range.

Liquid cell is filled with a probe and is put inside the spectrometer cell compartment.



IROS P03 is a research spectrometer for mid-IR spectrum analysis with spectral resolution of 0.12 cm^{-1}. Its operating spectral range can be spread.
Maximum sensitivity is reached using changeable detectors and IR radiation sources for operating spectral ranges.
There are 2 optical ports: input for radiation injection from external source, output while working with special equipment and detectors.

Radiometric unit is mounted at the input optical port and is used for external radiation source spectrum registration:

- Air pollution track monitoring method, remote sensing (passive / active mode)
- Toxic gases and vapours detection and identification
- Research
- Technology process parameters and product quality control in photonics, optics, light engineering
- Special-purpose machinery products design and test

Micro-objective is designed for FTIR spectrometer spectral range spread and sensitivity improvement using external detectors (Si bolometer with liquid nitrogen cooling).

IROS FTIR spectrometers for gas analysis

Multi-component gas mixtures, pure gases, organic solvent vapours research, transmission IR spectrum registration.

- Depending on a gas mixture needed component concentration simple or multi-pass cells are being used (optical path is from 100 mm to 40 m)
- If there is a risk of vapour condensation, thermostatted cell and heated up to 250 ºC gas line are being used
- For air (remote sensing) track measurements are being conducted (radiometric unit for spectrometer)

IROS P03 based FTIR spectrometer atmospheric composition analyzer

Climate active gases detection in the air:

- CH4, CO, CO2, H2O, N2O
- Sensitivity limit < 0.1 ppm

IROS P03 spectrometer based gas analyzer has 2 registration channels:

- Multi-pass gas cell, optical path length of 40 m, surface air quantity analysis with discrete sample collection
- Optical port for solar radiation (radiometric unit), gas component concentration detection in higher atmospheric layers

DETECTION LIMITS (3σ)*, ppm	
CO_2	1.0
CH_4	0.02
CO	0.05
N_2O	0.004

* - multi-pass gas cell, 40 m

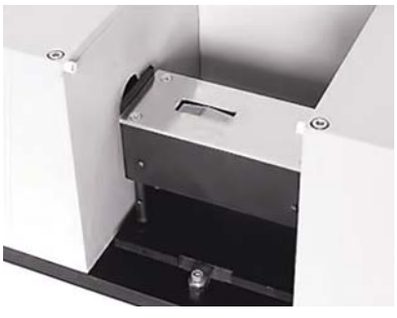
Automated measurements: autosampler unit

Autosampler unit has a flow-liquid cell and a cell with comparison sample. Probe injection, cell solvent rinse.

Automatically performed probe and reference sample registration using internal peristaltic pump and stepper motor (cell movement).

Probe volume < 10 ml. Analysis time < 2 min.

Specular reflection attached modules: 10, 30, 45, 80



Non-destructive testing of solid homogeneous samples with reflective surfaces and surface coatings. Specular reflection attached modules with the fixed angle of beam incidence : 10º, 30º, 45º or 80º.

IROS P11 FTIR spectrometer

IROS P11 FTIR spectrometer is perfect for near-IR spectrum analysis. Changeable detectors are used: InGaAs for spectral range of 4000-9000 cm^{-1} and Si for spectral range of 8500-12500 cm^{-1}.

IROS P11 is used for pharmaceutical, chemical, polymer, textile, food and compound animal feed industries products identification and quantity analysis.

Accessories for sample preparation

Manual mechanical press

Intended for sample preparation in form of compressed tablets 3.5 mm in diameter.

Obtained tablets can be analyzed using FTIR spectrometer with vertical or horizontal micro-focusing attached module.

Hydraulic press

Intended for sample preparation in form of compressed tablets with up to 13 mm in diameter. Working pressure 100-200 bar.

Obtained tablets can be analyzed using FTIR spectrometer with KBr tablet holder and window-substrates 13 mm diameter or with micro-focusing attached module (for 3.5 mm diameter tablets).

Mini-press for obtaining thin layered sample on steel mirror plates

Obtained thin layered sample can be analyzed using FTIR spectrometer with specular reflection attached module.

Thin layered sample on mirror alloy steel plate is investigated via double transmission method. Light passes through the layer, reflects from the plate surface and passes again through the sample.

IR microscope scans thin layer to select the most informative area. If the receives has inhomogeneous structure IR microscope gets spectral characteristics of this structure.

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