



Time-Resolved Spectral Measurement Services, Femtosecond Spectroscopy

We offer professional time-resolved spectroscopy measurements using excitation with ultrashort light pulses (89 fs), covering an excitation range from 238 nm to 2800 nm, utilizing a streak camera.

Scope of Services

- Time-resolved spectroscopy measurements
- Measurements over a wide excitation range (238 nm–2800 nm)
- Time-resolved spectroscopy measurements as a function of temperature (5 K–800 K)
- High accuracy and repeatability of results

Why work with us

- Scientific-grade results
- Short turnaround times
- Extensive experience in time-resolved spectroscopy measurements
- A unique excitation setup based on the Coherent Libra Ti:sapphire laser system, combined with the OPerA Solo optical parametric amplifier, featuring the following beam parameters:
 - ✓ Ti:sapphire laser wavelength: 800 nm
 - ✓ Ti:sapphire laser pulse energy: 1 mJ
 - ✓ Pulse duration: 89 fs
 - ✓ Repetition rate: 1 Hz to 1 kHz
 - ✓ Tunable excitation range using OPerA Solo: 238 nm – 2800 nm
- Time-resolved spectral measurements performed using a streak camera C5680, covering a spectral range from 300 nm to 1100 nm and a temporal range from 10 ms to 20 ps
- Individual approach to each project

Flexible Pricing

Each project is priced individually, depending on the complexity of the measurements.

Contact: To discuss details or request a quote, please contact: Robert Kowalski -
e-mail: r.kowalski@intibs.pl



Fluorescence Spectroscopy Measurements (FLS980 Spectrometer)

FLS980 fluorescence spectrometer allows to measure the excitation spectra, emission spectra, and the luminescence decay curves. FLS980 spectrofluorometer equipped with two excitation sources: a continuous xenon lamp with a power of 450 W and a pulse xenon lamp with a power of 150 W. The single and double grating monochromators used in the FLS980 are of the Czerny-Turner configuration with 300 mm focal length, high optical throughput, excellent stray light rejection, and low temporal dispersion. The excitation monochromator is equipped with a diffraction grating with a constant 1800 lines/mm illuminated at a wavelength of 250 nm, while the emission monochromator is equipped with a diffraction grating with a constant 1800 lines/mm illuminated at a wavelength of 500 nm for the visible range or 1200 nm for the near-infrared range. The spectrofluorometer is equipped with two detectors, the Hamamatsu R928P photomultiplier for the visible range and the liquid nitrogen-cooled Hamamatsu R5509-72 photomultiplier for the infrared range. Possibility to use color filters to cut off the signal from the excitation sources, in the case of low-emission samples. The detailed description of the achievable parameters is listed below:

Detectors and the excitation sources

Hamamatsu R928P photomultiplier

Can record the emission spectra from 200 nm to 830 nm. The effective detection range is from 300 nm to 800 nm. The noise value is 10 counts. The highest signal ~ 1 000 000 counts. Smallest resolution – 0.05 nm. Correction on the detector sensitivity.

Hamamatsu R5509-72 photomultiplier

Can record the emission from 600 nm to 1650 nm. The effective detection range is from 1000 nm to 1600 nm. The noise value is 30 000 counts. The highest signal ~ 1 000 000 counts. Smallest resolution – 0.05 nm. Correction on the detector sensitivity.

450 W xenon lamp

Can emit light from 200 nm to 1180 nm. The effective working range is from 300 nm to 800 nm. Smallest resolution – 0.05 nm.

150 W pulse xenon lamp

Can emit light from 200 nm to 800 nm. The effective working range is from 300 nm to 800 nm. Smallest resolution – 0.05 nm.

External laser diode sources

It is a possibility to use external laser diode sources to increase the signal intensity from the samples. The available laser diodes operate at λ_{exc} – 266 nm, 375 nm, 395 nm, 450 nm, 808 nm, 940 nm, 980 nm, 1064 nm, 1530 nm.



cryostat - CS202AE-DMX-1AL

FLS 980 is equipped with the cryostat, allowing control of the temperature from 5 K to 300 K. The possible achievable temperature depends on the samples. Bulk materials and powders could be used for temperature measurements.

Type of samples

- Solutions, thin films, powders, and bulk materials
- Nanomaterials
- Organic and inorganic compounds
- Biological samples

Emission spectra

- Visible range (from 200 nm to 830 nm, step 0.05)
- NIR range (from 800 to 1650 nm, step 0.05)

Excitation spectra

The excitation spectra could be measured from 200 nm to 1180 nm, while the noise-to-signal value will vary in the different regions:

- Higher sensitivity range (from 300 to 800 nm, step 0.05)
- Lower sensitivity range 1 (from 200 nm to 300 nm, theoretical step 0.05 nm, real step 0.2 nm)
- Lower sensitivity range 2 (from 800 nm to 1180 nm, theoretical step 0.05 nm, real step ~1 nm)

Luminescence decay time

- Excitation - from 200 nm to 800 nm, step 0.05 nm
- Emission - from 200 to 1650 nm, step 0.05 nm.
- Time resolution from a few μ s to 100 ms.

Quantum yield

Quantum yield could be measured for the transparent materials or for the solutions. There is a possibility of measuring the quantum yield for powders.

Contact: Additional information, cooperation **e-mail:** m.chaika@intibs.pl



ICP-OES Elemental Analysis Services

Precision • Reliability • Flexibility

Advanced Elemental Analysis for Research & Industry

We offer professional ICP-OES analysis using the Thermo Scientific iCAP 7000 Series, delivering fast and accurate determination of elemental composition across a wide range of materials.

What We Offer

- Multi-element analysis in a single measurement
- Detection of metals and selected non-metals
- Wide concentration range (trace to high levels)
- High accuracy and reproducibility

State-of-the-Art Sample Preparation

- Microwave digestion with Milestone ETHOS UP
- Complete decomposition of complex samples
- Controlled temperature and pressure conditions
- High throughput (multiple samples processed simultaneously)

Why Choose Us

- Reliable, research-grade results
- Fast turnaround times
- Expertise in complex materials
- Individual approach to every project

Flexible Pricing

Each project is evaluated individually.

Pricing depends on sample type, complexity, and analytical requirements.

Get in Touch: To discuss your project or request a quote, please contact:
Anna Wędyńska e-mail: a.wedzynska@intibs.pl



IR and Raman Measurements

Instrumentation

- MultiRAM FT-Raman Spectrometer (Bruker) with 1064 nm laser (3600-50 cm^{-1})
- Nicolet™ iS50 FTIR Spectrometer (Thermo Fisher) in the near, mid, and far infrared ranges (12500-50 cm^{-1})
- Nicolet™ iN10 FTIR Microscope (Thermo Fisher) (4000-400 cm^{-1})
- inVia Raman Confocal Microscope (Renishaw) with 488 nm (50-4000 cm^{-1}), 514.5 nm (100-4000 cm^{-1}), and 830 nm (10-2000 cm^{-1}) lasers

Measurement Capabilities

- Measurements of Transmission, absorption, reflection, and ATR (Ge, diamond)
- Resolution: 0.5–16 cm^{-1} (IR), ~0.5–4 cm^{-1} (IR) cm^{-1} (Raman)
- IR and Raman mapping
- Polarized light measurements
- Temperature range: 80–850 K (Linkam THMS600) and 7–320 K (CS202AE-DMX-1AL closed-loop helium IR cryostat and CS204AF-DMX-20-OM-R Raman cryostat, Advanced Research Systems)

Contact: p.deren@intibs.pl

Refractive Index Measurement Service (n)

We offer precise measurements of the refractive index over a wide wavelength range using a Varian Cary 5E (Agilent) UV-Vis-NIR spectrometer equipped with a Brewster-angle accessory for refractive index determination.

Service scope

- measurement of refractive index $n(\lambda)$ in the wavelength range **450–2000 nm***
- determination of material dispersion characteristics
- measurement of small samples (measurement area approx. **2 × 3 mm**)

Materials

- glasses
- crystals
- glass-ceramics
- composites
- other optical and semi-transparent materials

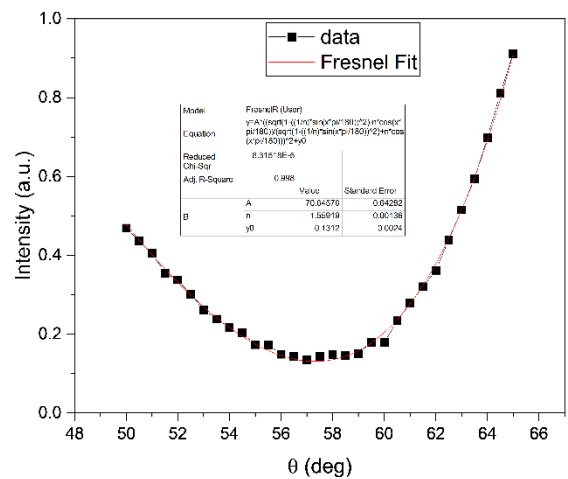
Sample requirements**

- samples in the form of plane-parallel plates
- optically polished surfaces
- mechanically stable samples
- minimum measurement area: approx. **2 × 3 mm**

Applications

- optical materials research
- quality control
- optical modelling
- design of photonic and laser components

Contact: For details or a quotation, please contact us at: b.bondzior@intibs.pl





Absorption Measurements

Cary 5000 UV-Vis-NIR Spectrophotometer (Agilent Technology)

- Spectral range: 180 – 3300 nm
- Spectral width: UV-Vis 0.01 – 5 nm, NIR 0.04 – 20 nm
- Photometric range up to 8 Abs

Equipment of the Cary 5000:

- Flow-through cryostat (Optistat CF, Oxford Instruments) with accessories, Temperature range: 2.2 – 300 K (measured in helium),
- Oven (home-made -INTiBS), Temperature range: 20 – 500 C (measured in air),
- Universal adapter (UMA, Agilent Technology)

Additionally, to the absorption and transmission measurements we offer:

- measurements of the angular dependence of optical absorption spectra, determination of the critical angle.
- diffusive scattering measurement device (Praying Mantis, Harrick Scientific), and Low Temperature Reaction Chamber (Harrick Scientific) Temperature range: -150 - 600C (measured in vacuum)

Contact: If you are interested in measurement options, please contact us: p.deren@intibs.pl



Emission Quantum Yield Measurements

Equipment

- Hamamatsu PMA-12 photonic multichannel analyser operating in the 200-950 nm range
- Hamamatsu PMA-12 photonic multichannel analyser operating in the 350-1100 nm range
- Linkam THMS600 temperature controller
- Excitation sources in the form of laser diodes generating lines with a wavelength of: 266, 360, 405, 444, 450, 488, 588, 808 nm
- Hamamatsu integrating sphere equipped with a 150W xenon lamp as an excitation source, coupled with a monochromator.

Measurement capabilities

- Emission spectrum measurements in the 200-950 nm and 350-1100 nm ranges, with a resolution of < 2 nm and < 2.5 nm, respectively
- Emission spectrum measurements over a wide temperature range of 80-850 K
- Measurements of quantum efficiency in the integrated sphere at room temperature in the 400–1100 nm range, with a resolution of < 2.5 nm

Contact: More information on cooperation at: p.deren@intibs.pl



Spectroscopic Studies and Measurements *Collaboration Offer for Scientific and Industrial Partners*

We offer collaboration in the field of advanced, precise, and professional spectroscopic studies and measurements using **FLS 1000 DD-stm** and **Dongwoo Optron 711/158i spectrofluorometers**, enabling comprehensive analysis of spectroscopic and luminescent properties of materials over a wide spectral, temporal, and temperature range.

Experimental Scope of Collaboration

- Measurement of emission and excitation spectra of luminescence
- Luminescence lifetime analysis – TCSPC and MCS techniques
- UV–Vis–NIR spectroscopy (200–2550 nm)
- Temperature-dependent measurements (4.2 K – 800 K) using cryostats and vacuum systems
- Fluorescence microscopy with lifetime mapping
- Quantitative analysis of luminescence efficiency
- Polarized light measurements
- Studies using pulsed excitation sources (ps LEDs, Xe flash lamp, lasers, supercontinuum)
- Investigations of solids, liquids, and micro- and nanostructured systems

Instrumentation and Capabilities

The measurement systems **FLS 1000 DD-stm** and **Dongwoo Optron 711/158i** are equipped with:

- Light sources: 450 W xenon lamp, 60 W flash lamp, pulsed LEDs (255–405 nm), supercontinuum
- Double excitation and emission monochromators
- TCSPC/MCS module (TCC2) for time-resolved measurements
- Detectors: PMT (up to 980 nm), MCP, and InGaAs (up to 2.55 μm)
- Cryogenic systems (Cryosphere, Cryostat CS204, Oxford Instruments)
- Nikon fluorescence microscope with lifetime mapping
- Polarization optics and function generators

Scope of Collaboration and Potential Benefits

- High scientific quality of results
- Experience in advanced spectroscopic research
- Experimental and data interpretation support
- Implementation of joint research projects
- Access to unique research infrastructure
- Broad measurement range (spectral, temporal, and temperature)

Contact

For collaboration inquiries, please contact: Radosław Lisiecki e-mail: r.lisiecki@intibs.pl, tel. 0048713954182



Thermoluminescence Optically Stimulated Luminescence Radioluminescence

1. Available opportunities (short instrument description).

A fully automated TL/OSL reader (Lexsyg research, Freiberg Instruments) designed for high-precision investigation of defect-mediated processes in functional materials. The system is equipped with a PMT (VIS-NIR PMT (380 – 980 nm) from HAMAMATSU R13456) and EM CCD (iDus 420 Series DU420A (200 – 1050 nm) from Andor) detection modules, enabling spatially resolved and spectrally sensitive measurements of:

- Thermoluminescence (TL)
- Optically Stimulated Luminescence (OSL)
- Radioluminescence (RL)

All listed measurements, including radio-fluorescence and luminescence measurements (OSL, RL, etc.), can be performed over a wide temperature range from -40 to 500°C in air and nitrogen atmospheres. As an irradiation source, an X-ray tube (Varian VF-50J), a blue laser diode at 445 (max. 100 mW/cm²) and an NIR laser diode at 980 nm (max. 300 mW/cm²) can be used. The heating rate can be set in the range 0.1-20.0 °C/s.

2. Measurement Capabilities

Based on the available platform, the following measurements can be realised:

- Determination of trap depth distributions and kinetic parameters
- Investigation of persistent luminescence mechanisms (including NIR-active systems)
- Radiation response characterization (dosimetry, defect formation)
- Time and temperature resolved luminescence (via EM CCD)

3. Collaboration Opportunities

The infrastructure is well-suited for joint research in:

- Persistent luminescence and energy storage phosphors
- Radiation dosimetry materials
- Defect engineering in oxides, garnets, and spinels
- Luminescent sensing and photonic materials

Flexible experimental design and adaptation to specific material systems are possible.

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Spectral Measurements of Emission and Excitation in the Vacuum Ultraviolet (VUV)

McPherson Spectrophotometer

Our laboratory offers advanced luminescence characterization using a high-end McPherson spectrometer equipped with a deuterium-xenon lamp. This system enables spectral measurements of emission and excitation over a very wide spectral range, from 120 nm to 1700 nm, at room and liquid nitrogen temperature.

To ensure optimal quality of VUV measurements, the spectrometer is coupled to a turbomolecular vacuum pump, allowing for deep VUV (120 – 200 nm) studies. Measurements can be performed at room temperature and in liquid nitrogen, offering great experimental flexibility.

In addition, the system is integrated with pulsed laser sources, including a Ti: Sapphire laser and an Nd: YAG laser. This setup allows for the measurement of the emission lifetime of luminescent materials, with excitation in the 965–715 nm and 485–350 nm ranges, as well as at the second and fourth harmonics of the Nd: YAG laser (532 nm and 266 nm).

Our equipment enables comprehensive characterization of luminescent materials, including:

- Emission and excitation spectra
- Vacuum UV luminescence study
- Luminescence lifetime measurement

We invite you to collaborate with us and offer professional measurement services for a wide range of materials, such as glasses, crystals, ceramics, and nanomaterials.

Contact: For more information, please contact us by email: n.rebrova@intibs.pl