



Insplorion

XNano

Product and Technology Information



- **True nano-scale measurements** - Monitor processes in/on nanoparticles, nanostructures, and thin films in the few tens of nm size-range and at the hidden internal interface of thick films.
- **Suitable for any sample material** - The nanomaterial to be studied can be soft, hard, metallic, ceramic, polymeric, biomolecular, porous, conducting or insulating.
- **Real-time analysis** - Measure with sub-second temporal resolution.
- **Complete system** - The XNano system includes Optics Unit, Temperature Control Unit, Liquid Handling System, Measurement Cell and Desktop Computer with Insplorer Control Software.
- **In-situ measurements** - Measure in liquid or in air at select temperature.
- **User friendly** - The XNano system design is compact, robust and easy to use.

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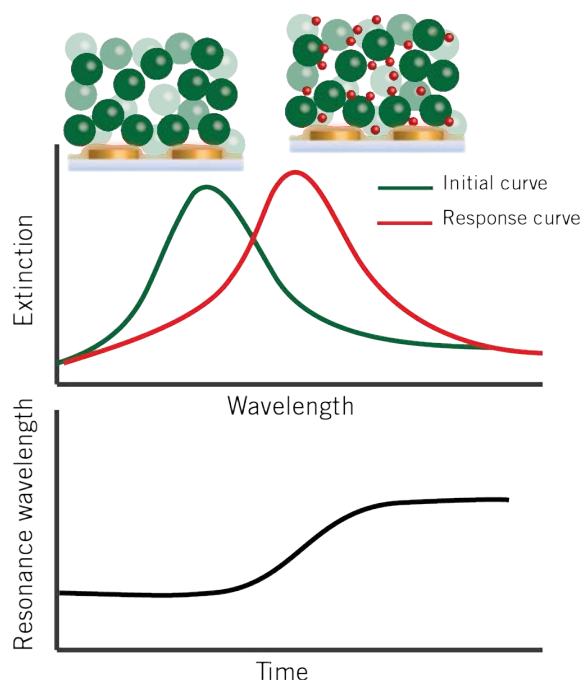
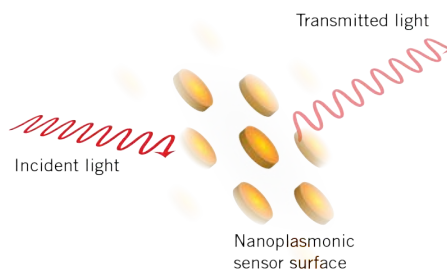
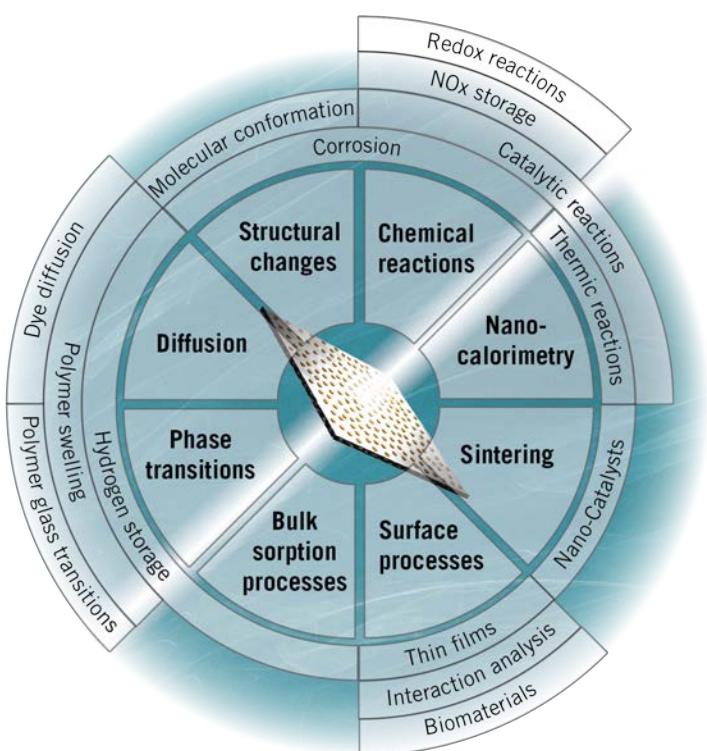
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Insploirion XNano

The Insploirion XNano modular instrument system provides the opportunity to study processes occurring within or on nanomaterials and at interfaces. The XNano measurement cell is very flexible and compatible with both liquid and gas phase measurements at temperatures of up to 80°C. The integrated fluidic system simplifies sample handling and delivery, minimises sample consumption and makes the XNano especially well suited for applications within life science, polymer science, and nanochemistry. The very large dynamic range enables high sensitivity studies of processes in both thin films and at the hidden internal interface of thick surface coatings under variable conditions.

The XNano product offer includes all hardware, software, support and initial training needed to get started quickly.

Many different processes and systems can be studied with the XNano system. The chart lists some of the proven applications. More information, application notes and scientific references can be found on the Insploirion webpage: www.insploirion.com



Nanoplasmonic Sensing by Insploirion

Insploirion's proprietary technology, NanoPlasmonic Sensing (NPS) is extremely robust, non-invasive, sensitive, and offers high temporal resolution. The nanostructured NPS sensor is the key component of the XNano instrument. The technology is based on the optical phenomenon of Localized Surface Plasmon Resonance (LSPR) in metal nanoparticles. The individual plasmonic particles act as nano-sized optical sensors or antennas. The plasmonic particles exhibit a resonance wavelength at which the extinction of incident light is maximal. The resonance wavelength is extremely sensitive to any changes in molecular concentration or composition in the immediate vicinity (<50 nm) of the plasmonic particle. By monitoring shifts in the resonance wavelength in real time it is possible to follow for example the binding kinetics of a small molecular species in a porous film as illustrated in the example above.

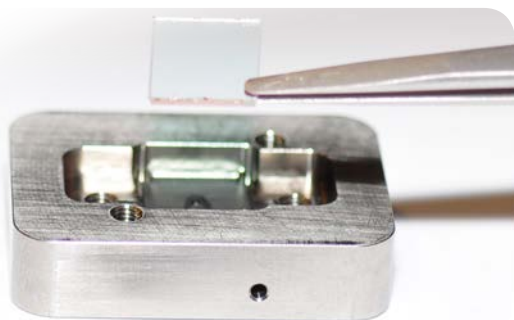
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Measuring is easy

Starting an Acoulyte measurement is easy. The different steps are described in the picture sequence below:

1



Mount the sensor chip in the titanium cartridge. If desired, the sensor chip can be precoated with the nanomaterial or thin film to be studied.

2



Use the Insplorer Software Wizard to configure and program your measurement.

3



Perform measurements in situ via the integrated fluidic system and monitor your results in real-time.

Insplorer Software

The Insplorer Software provides full control of measurements and allows all users to setup and save their own methods.

The software algorithms offer real-time optical data analysis with high resolution. Up to seven parameters are analysed and presented in real time during a measurement. All raw data is automatically stored and can be post-processed within the Insplorer software, or exported in an ASCII-based format compatible with any graph drawing software.

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Specifications

Measurement cell

Volume above sensor	~ 4 μL
Minimum sample consumption	~ 100 μL
Typical flow rates	20-100 $\mu\text{L}/\text{min}$
Materials*	Titanium and Kalrez [®]
Temperature range**	Room temperature to 80°C

*Custom choices are available. **Temperatures up to 250°C can be obtained with optional configuration.

Sensors

Size	9.5 x 9.5 mm, 1 mm thick
Substrate	Fused silica
Surface	Nanostructured gold
Standard coatings	Au, Si_3N_4 , SiO_2 , Al_2O_3 , TiO_2

Measurement characteristics

Light source	Tungsten-Halogen lamp
Measured spot diameter	2 mm
Time resolution	Up to 10 sample points per second
Typical noise	<0.01 nm in wavelength
Wavelength range	450-1000 nm

Dimensions (Width x Depth x Height)

XNano module	31 x 25 x 25 cm
Insplorion optics unit	25 x 27 x 9 cm
Temperature Control Unit	225 x 27 x 9 cm

Software

Compatible software	Insplorer
Operating system	Microsoft Windows compatible
Output data format	ASCII compatible for straightforward use with any graph drawing software
Analysed parameters	Multiparameter readout (e.g. resonance wavelength and extinction at the LSPR peak)