**Liquid chromatograph with diode-array detector Dionex**

**Equipment: Liquid chromatograph with diode-array detector Dionex (included in the Laboratory of Photochemistry)**

**No. of Equipment: UJEP9**

**Responsible coordinator:** Prof. Ing. Pavel Janoš, CSc.

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**Equipment Description**

**Description of equipment:**

**Liquid chromatograph with DAD detector – DIONEX Ultimate 3000**

**Pump – LPG-3400SD Quarternary Standard Pump**

* Serial dual-piston operating principle, low pressure gradient proportioning
* Flow rate: 200 μl/min to 10 ml/min
* Flow accuracy ±0,1%
* Flow precision <0.05% RSD or <0.01 min SD whichever is greater
* No. of eluent lines: 4
* Proportioning accuracy ± 0,5%
* Operating pressures: up to 620 bar
* Internal four-channel micro membrane degasser

 **Column Compartment – TCC-3000SD Thermostatted Column Compartment**

* Cool-Down time: 15 min
* Max. column length: 30 cm
* Heat up time: 15 min
* Temperature accuracy: ± 0,5 °C
* Temperature range: 5 – 80 °C

**Diode Array Detector - DAD - 3000**

* 1024 element diode array, data rate up to 100 Hz, 10 ml/min
* Detector type: single Beam
* Drift: <1mAU/hr
* Flow rate: analytical to semi-prep
* Temperature control: yes
* Flow cell volume: variable
* Pixel resolution: < 1.0 nm
* Wavelength accuracy: ± 1 nm
* Wavelength range: 190 – 800 nm
* Response: 2 sec

**Specification of expertise relevant to NanoEnviCz workpackages:**

**WP4**a,b,c **WP6**a,b,e, **WP7**a

**Detailed description of expertise**

**Please, specify the main research topics connected with equipment**:

**Testing of the photo-degradation efficiency of nanocrystalline metal oxides and other (nano)materials**

Photo-catalytic activity of nanomaterials towards selected model compounds (dyes, pesticides, chlorophenols, …) or other contaminants

**Please, specify the secondary research topics connected with equipment**:

**Homogeneous photo-catalytic processes**

Mechanisms and kinetics of the photo-catalytic reactions, identification of reaction products and reaction pathways

**Keywords describing research area:**

Photocatalytic activity, Heterogeneous photocatalysis, Homogeneous photocatalysis

**Competence**

**Relevance for applied and industrial research:**

Modular testing equipment that allows to measure a photocatalytic activity of various nano(materials) under highly reproducible conditions with pre-determined model contaminants (dyes, pesticides, chlorophenols, …) or customer-specified target compounds.

Kinetic measurements under strictly specified conditions, optimization of the photo-catalytic process, estimation of degradation efficiency and other performance characteristics.

Exploitation of f**undamental understanding** of materials structure/activity for new kinds of photo-catalysts.

**Relevance for fundamental studies:**

Studying the mechanisms and kinetics of heterogeneous photo-catalytic reactions