**Analyser of total and organic carbon**

**Equipment:** Analyser of total and organic carbon (TOC)

**No. of Equipment: UJEP20**

**Responsible coordinator:** doc. Ing. Josef Trögl, Ph.D.

**Name of Institution:** Jan Evangelista Purkyně University in Ústí nad Labem, Faculty of Environment

**Address of Institution:** Králova Výšina 3132/7, 400 96, Ústí nad Labem, Czech Republic

**E-mail:** josef.trogl@ujep.cz

**Telephone:** +420 475 284 153

**Homepage:** <http://fzp.ujep.cz>

**Contact person:** doc. Ing. Josef Trögl, Ph.D.

**E-mail:** josef.trogl@ujep.cz

**Telephone:** +420 475 284 153

**Equipment Description**

**Description of equipment:**

Semi-automatic analyser of organic and total carbon in solid and liquid samples

**General characteristics**

**Analytes:** Total Carbon (TC), Total Inorganic Carbon (TIC), Total Organic Carbon (TOC),

**Method:** TC: High temperature catalytic combustion, adjustable 50 – 1100 °C

 IC: Inorganic carbon release by acidification at temperatures up tu 150 °C

**Samples:** Soil, plant, sediment, sludge, waste, swab method for cleaning validation

**Samble introduction:** Unique vertical bottom to top sample introduction system

**Features:** Automatic balance interfacing, re-usable quartz crucibles, Complies with international regulations such as ISO 10694, EN 13137 and EN 13639

**Operational and Performance Characteristics**

**Measuring range:** 0,02 – 100%

**Analytical Range:** 0,5 – 40 mg C Absolute

**Analysis time:** Approx. 3-5 minutes

**Sample size:** Solid samples: up to 3 gram (300-5000 mg nominal)

**Oven temperature:** 1100 °C

**Reproducibility:** < 2% RSD, FSD (full scale deflection)

**Data processing:** Area calculation

**Physical Characteristics**

**Gas Combustion:** Oxygen analytical grade ≥3.5 (containing less than 10 ppm CO2)

**Power requirements:** 100 – 120 V, 220 – 240 V, 50/60 Hz

**Dimensions(hxdxw):** 73 x 30 x 40 cm

**Weight:** 20 kg

**Equipment:** Microplate spectrophotometer SpectraMax 190

**No. of Equipment: 1**

**Responsible coordinator:** doc. Ing. Josef Trögl, Ph.D.

**Name of Institution:** Jan Evangelista Purkyně University in Ústí nad Labem, Faculty of Environment

**Address of Institution:** Králova Výšina 3132/7, 400 96, Ústí nad Labem, Czech Republic

**E-mail:** josef.trogl@ujep.cz

**Telephone:** +420 475 284 153

**Homepage:** http://fzp.ujep.cz

**Contact person:** doc. Ing. Josef Trögl, Ph.D.

**E-mail:** josef.trogl@ujep.cz

**Telephone:** +420 475 284 153

**Equipment Description**

**Description of equipment:**

Universal 96-well microplate UV-VIS spectrophotometer with PathCheck technology for correction of sample volume variations.

Specifications and technical features:

Wavelength Range: 190-850 nm

Wavelength Selection: Monochromator, tunable 1/0 nm increments

Wavelength Bandwidth: ≤ 2.0 nm

Wavelength Accuracy: ± 1.0 nm

Wavelength Repeatability: ± 0.2 nm

Photometric Range: 0.0 to 4.0 OD

Photometric Resolution: 0.001 OD

Photometric Accuracy: < ± 0.006 OD ± 1.0%, 0.0 - 2.0 OD

Photometric Precision: < ± 0.003 OD ± 1.0%, 0.0 - 2.0 OD

Stray Light: < 0.05% @ 230 nm

Light Source: Xenon flash lamp

Microplate Read Time – Endpoint: 9 seconds

Microplate Read Time – Kinetic: 9 second minimum interval

Temperature Range: Ambient + 4 °C up to 45 °C

Temperature Uniformity: ± 0.5 °C @ 37 °C

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

**WP4**a,b,c, **WP5**a, **WP6**a, **WP7**a-e, **g-**i**, WP8**a-c, **WP9**a-c,e,f

**Detailed description of expertise**

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

**Toxicity and risk of nanomaterials and environmental processes**

Microbial inhibition tests

Enzyme inhibition assays

Antimicrobial characteristics of textiles according to AATCC standards

Enzyme mimetic properties of materials

Description and characterization of decontamination and bioremediation processes, determination of the mineralization rate of organic pollutants

Description and characterization of water-purification processes, determination of the mineralization rate of organic pollutants

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

**Effective catalytic technologies**

Characterization of the rate of mineralization of organic pollutants by photocatalytic processes.

Characterization of sorption properties of materials

Degradation of hazardous chemicals and materials (warfare agents, pesticides...)

Degradation of chemical warfare agents

**Keywords describing research area:**

Total organic carbon, total carbon, mineralization of organic pollutants

**Competence**

**Relevance for applied and industrial research:**

Determination of total organic carbon in samples of soil, sludges, wastes and waste-water

Characterization of rate of organic pollution and its decrease upon decontamination

Complex characterization of toxicity of nanomaterials

Characterization of antimicrobial properties of textiles

**Relevance for fundamental studies:**

Understanding of the fate of organic pollutants during decontamination and bioremediation processes (mineralization / modification / assimilation into biomass)

Characterization of the mineralization rate of photocatalytic processes

Determination of toxicity of nanomaterials

Determination of kinetic of degradation processes

Determination of enzyme activities

Determination of enzyme-mimetic properties of materials