**Equipment:** Respirometer

**No. of Equipment: TUL12**

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**Equipment Description**

**Description of equipment:**

Continuous automatic Micro-Oxymax Respirometer with O2 sensor, CO2 sensor and CH4 sensor. Respirometer has ten positions for samples and thermal bath.

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

|  |  |
| --- | --- |
| **WP3 SYNTHESIS AND DESIGN OF NEW MULTIFUNCTIONAL NANOMATERIALS FOR ENVIRONMENT PROTECTION** | |
| Conceptually new nanostructured materials with the potential for application in innovative technologies |  |
| Computer aided nanomaterials design |  |
| Low dimensional materials and their composites (carbon dots, nanotubes, graphene derivatives) |  |
| Nanofibers |  |
| Magnetic hybrids |  |
| Metal and metal oxide NPs |  |
| Redox active nanomaterials |  |
| Nanomaterials for biomedical applications |  |
|  | |
| **WP4 HETEROGENEOUS CATALYSIS FOR ENVIRONMENTAL PROTECTION** | |
| Nanomaterials for catalytic degradation of pollutants in water, soil and air |  |
| Nanostructured heterogeneous catalysts for abatement of pollutants from industrial processes and automotive transport |  |
| New “clean” catalytic processes for chemical production |  |
|  | |
| **WP5 NOVEL NANOMATERIALS AND TECHNOLOGIES FOR SUSTAINABLE PRODUCTION** | |
| Processes and technology for sustainable energy and chemical production |  |
| Catalytic processes for transformation of natural gas to liquids |  |
| Nanomaterials for utilization of renewables; Magnetically separable green catalysts |  |
|  | |
| **WP6 EFFECTIVE PHOTOCATALYTIC TECHNOLOGIES** | |
| Mastering nanomaterials for photocatalysis |  |
| Effective photocatalytic processes |  |
| Photovoltaic paints |  |
| Functional surfaces for environmental protection | 1 |
| Hybrid materials combining photocatalysts and heterogeneous catalysts |  |
| Thin photocatalytic films for direct solar splitting of water |  |
|  | |
| **WP7 NANOTECHNOLOGY FOR TRAPPING AND CHEMICAL DEGRADATION OF POLLUTANTS** | |
| Nanomaterials for sorption |  |
| Natural based nanomaterials produced by “green” technology |  |
| Reactive sorbents for degradation of pesticides and highly toxic agents |  |
| Degradation of chemical warfare agents |  |
| Analysis of filtering capabilities of nanomaterials |  |
| Elimination of radionuclides contamination |  |
| Modified nanofiber filters; Advanced antimicrobial filters/membranes | 1 |
| Nanoiron for groundwater and waste water treatment | 1 |
| Nano-trapping of heavy metals |  |
|  | |
| **WP8 SENSING AND MONITORING OF POLLUTANTS** | |
| Efficient sensing of pollutants |  |
| Biosensing by new devises |  |
| Application of new sensors in monitoring of pollutants |  |
| Magnetic sensors; Magnetically assisted SERS sensors |  |
| Advanced electrochemical sensors |  |
| Graphene based nanosensors |  |
|  | |
| **WP9 TOXICITY AND RISKS OF NANOMATERIALS** | |
| Health risks |  |
| Environmental risks | 1 |
| „In vitro“ and „in vivo“ toxicity tests – cytotoxicity, genotoxicity, interactions with membrane | 1 |
| RNA gene expression changes and protein expression changes |  |
| Complete eco/aquatoxicity ecotoxicity evaluation | 1 |
| Toxicity against bacteria and fungi | 1 |

**Detailed description of expertise**

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

Respirometer (O2/CO2/CH4 sensors) is able to measure oxygen consumption, carbon dioxide production and methane production in various matrices. Respirometer is designed for monitoring the biodegradation of organic substances in water (soil, gas) environment. It can be used for measurement in aerobic and anaerobic conditions.

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

Toxicity, biostability and biodegradability of various substances could be measure with respirometer. Similarly, microbial metabolism of various substrates could be monitored.

**Keywords describing research area:**

respiration, bacteria, biodegradation, biostability, toxicity, substrate, microbial metabolism

**Competence**

**Relevance for applied and industrial research:**

Toxicity of nanomaterials and biodegradation of various substances could be monitored in environmental matrices (water, soil, activated sludge).

**Relevance for fundamental studies:**

Toxicity of nanomaterials and biodegradation of various substances could be monitored in environmental matrices (water, soil, activated sludge).

**Comments**