**Gas chromatograph with Mass spectrometer**

**Equipment:** Gas chromatograph with Mass spectrometer (GC-MS) connected with a photocatalytic reactor

**No. of Equipment: UACH7**

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**Equipment Description**

**Description of equipment:**

GC Agilent 6890N with quadrupole MS Jeol JMS-Q100GC connected with the homemade photocatalytic reactor with an automatic sampler.

The photocatalytic reactor consists of airtight stainless steel cover and quartz tube with a light source (Narva Lamp 13W UV 365 nm or Vis >400 nm). The thin layer of the photocatalyst on substrate can be attached to the inner wall of the reactor. The model compound (acetone, acetaldehyde, butane, etc.) is injected to the oxygen atmosphere in the reactor and the photocatalytic decrease of the model compound, consumption of oxygen and production of any other gases can be observed and quantified by GC-MS. The reactor is connected to the chromatograph by automatic six-port sampling valve with a timer allowing the automatic sampling in predetermined time intervals.

**Specifications and technical features:**

gas chromatography column (19091P-QO4, J&W Scientific)

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

**WP6**b,c,d **WP7**c,d

**Detailed description of expertise**

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

1. Study of the kinetics and mechanism of the photocatalytic reactions of model compounds in gas-solid interface (for photocatalytic paints, thin layers, etc.)
2. Identification and quantification of the various volatile organic compounds from chemical or other processes (reactive adsorption, heterogenous catalysis, degradation of pesticides or other environmental pollutants)

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

None

**Keywords describing research area:**

Qualitative analysis, volatile organic compounds, photocatalysis on gas-solid interface

**Competence**

**Relevance for applied and industrial research:**

Sensitive and reproducible identification and quantification of the various volatile chemical compounds.  
Testing of the materials photocatalytic activity, such as photocatalytic paints, etc.

**Relevance for fundamental studies:**

Identification and quantification of the products of various chemical processes.

Study of the mechanism of reactions.

Study of the mechanism and kinetics of the photocatalytic processes on gas-solid interface.