**Flow reactor**

**Equipment: Flow reactor**

**No. of Equipment: UPOL12**

**Responsible coordinator:** Prof. RNDr. Radek Zbořil, Ph.D.

**Name of Institution:** Palacký University Olomouc, Regional Centre of Advanced Technologies and Materials

**Address of Institution:** Šlechtitelů 27, 78371 Olomouc, Czech Republic

**E-mail:** rcptm.services@upol.cz

**Telephone:** (+420) 58 563 4973

**Homepage:** www.rcptm.com

**Contact person:** Mgr. Jan Filip, Ph.D.

**E-mail:** jan.filip@upol.cz

**Telephone:** +420 585 634 959

**Equipment Description**

**Description of equipment:**

Continuous Flow Chemistry enables researchers to both evaluate and produce synthetic intermediates and products that would otherwise be inaccessible using conventional batch techniques. The scale that reactions are performed on is key to harnessing the advantages of this technology which stem from the rapid mixing and efficient thermal transfer at the µm to mm scale. It is consists of **H-Cube Continuous-flow Hydrogenation Reactor, Autosampler, The Phoenix Flow Reactor, Gas Module and 6-channel CatCart Changer.** It is generally usedfor the study of catalytic organic reactions including amination, C-C coupling reaction, oxidation, reduction, esterification, hydrogenation etc.

**Specifications:**

* It is a revolutionary bench-top standalone hydrogenation reactor, uniquely combining continuous-flow microchemistry with endogenous on-demand hydrogen generation and a disposable catalyst cartridge system.
* It allows fast and cost-efficient hydrogenation with superior yield when compared to conventional methods. The hydrogen gas necessary for the reaction is generated in-situ from the electrolysis of water.
* The Hydrogen/Substrate mixture can be heated and pressurized up to 100°C (212°F) and 100 bar (1450 psi) respectively.
* The mixture is then passed through a packed catalyst cartridge (CatCart), where the reaction takes place, and the product continuously elutes out of the CatCart and into a collection vial.
* Reductions varying in scale from 10 mg-10 g.

**Advantages**

* No cylinders or other external hydrogen source necessary.
* No catalyst filtration or direct catalyst handling.
* Easy catalyst exchange/ recyclable.
* Up to 450 °C temperature capability.
* 13 gases in one device like as- Compressed Air, O2, CO, ethylene, SynGas for hydroformylations, CH4, C2H6, He, H2, N2, N2O, NO, Ar.
* Up to 100 bar capability.
* Catalyst Screening.
* Reaction Optimization.
* Library Production.

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

**WP4**a-c, **WP5**a-c,

**Detailed description of expertise**

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

Metal catalyzed reaction in flow sequence

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

**Keywords describing research area:**

Catalysis, Flow chemistry

**Competence**

**Relevance for applied and industrial research:**

Time saving protocol with fast reaction rate

**Relevance for fundamental studies:**

**Comments**

This instrument is useful for different kind of organic transformation.