

Request for industrial partners and knowledge partners (June 4th, 2019)

Project title: CATalytically COated flow REactors for multi-phase industrial processes

Acronym: CATCORE

Project ID	
Type	ICON or COOP
Periode	2 years
Starting date	August 1, 2020
Total project budget (€)	To be determined
Total man months	To be determined
Subsidy percentage	According to SBO- and O&O regulations
Industrial partners (current)	Creaflow, Ajinomoto Bio Pharma Services, EcoSynth

Project description

Introduction

The pharmaceutical and fine chemical industries are increasingly adopting towards flow chemistry technology. The increased safety, improved product quality, cost efficiency, and overall production flexibility are the drivers for the growing demand of flow reactors. However, the current state-of-the-art and available technology for continuous processing still have some limits, especially when working with multi-phase reactions which include solids.

The proprietary COSTA-technology, based on the use of a linear process channel with static mixing elements combined with an oscillatory flow regime, expands the current boundaries for continuous processing thanks to the following features:

- Intense and tunable mixing (decoupled from the flow rate)
- Linear scalability
- Large customization potential

These advantages have already been demonstrated in the HANU-reactor, which uses the COSTA-technology. This performant HANU-reactor is a scalable flow photoreactor which was recently introduced onto the market by Creaflow (www.creaflow.be). As the intense mixing inherently facilitates multi-

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phase reactions (which are often mass transfer-limited) it may thus manifest itself as a game-changer beyond photochemical applications.

Goal

Within this context, the CATCORE project aims at applying advanced catalytic coatings to the reactor surface in order to intensify and optimize multi-phase industrially relevant reactions (solid-liquid as well as gas-solid-liquid systems).

In a first phase, the coated reactors will be tested at lab scale for industrially relevant example reactions (in pharma and chemical industry) to determine long-term performance. In a second phase, the coated reactors will be tested for specific test cases offered by the end users.

Expertise

The current partners bring in following expertise:

- Creaflo: Design and development of (customized) innovative and scalable flow reactors
- Aji Bio-Pharma: End user, use of catalytic coated reactors for specific reactions/productions in a pharma setting
- EcoSynth: Flow chemistry, optimization of industrially relevant reactions on lab scale and identification of critical process parameters

To complete the consortium, Catalisti is searching for additional partners from knowledge institutions or industry:

- 1) **Partners that are capable of efficiently applying performant catalytic coatings to the stainless steel reactor channel surface.**

Important remark: At this phase of project setup we are only requesting this particular expertise from knowledge institutions. In a later phase, we will send out a Request for Partners for knowledge institutions for other expertise, if needed.

Two main types of coatings that are relevant to this project can be distinguished:

- Photocatalytic coatings such as (doped) metal oxides, (photo)stable organic catalysts and 2D-polymers
- Metallic coatings, possibly supported, for industrially relevant gas-liquid-solid reactions (e.g. hydrogenations)

Any coating technology can be considered (wet coating, vapor deposition, 3D printing etc.). However, an important evaluation criterium will be the long-term steady-state performance (in terms of stability and minimal leaching) of the catalytic coating.

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2) Industrial end-users for which this coated reactor technology may offer a distinct improvement of their current or new process.

Partners that wish to participate in Catalisti-supported projects, are required to be Member of Catalisti. For more information on membership and membership fees please contact Leentje Croes (lcroes@catalisti.be).

How to reply to this request

Please send an **email** before **June 21st, 2019** to lcroes@catalisti.be with nverdonck@catalisti.be in CC, and **briefly describe your interest and potential contribution** to the project. Based on all applications, the current industrial partners will determine together with Catalisti which partners can join the consortium. After submission of your application, you can be contacted to further elaborate your offer. The decision will be communicated in a period of 1-2 weeks after the closing date of this Request for Partners, but could take longer depending on the number of applications. Please contact Leentje Croes (lcroes@catalisti.be, +32 472 889 776) if you have questions concerning this Request for Partners.

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