Sustainable Process Engineering
Micro Flow Chemistry & Synthetic Methodology

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

Enabling Oxidative Chemistry in Continuous-Flow Microreactors

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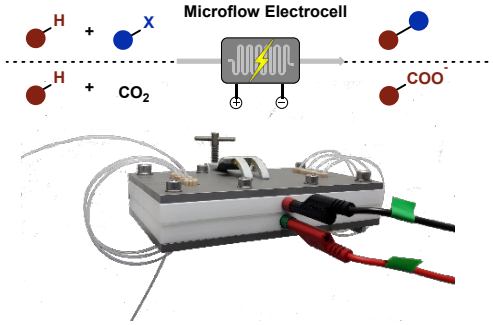
Introduction

Nowadays, the development of more sustainable and milder oxidation reactions is necessary, avoiding dangerous oxidants and expensive catalysts. The application of traceless reagents such as photons or electrons can improve dramatically the efficiency of these processes. Coupling these green approaches with continuous flow microreactor technology, these reactions can be carried out faster and more efficiently compared to the conventional batch reactors.

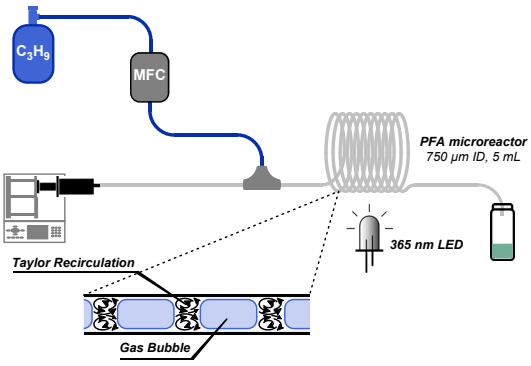
Project summary

Currently, both photochemical and electrochemical techniques are explored to provide milder oxidation reactions.



In our group an electrochemical microreactor was recently designed. With this reactor new electrochemical methodologies were explored. At the moment, investigation of electrochemical C—H activation reaction and CO_2 activation for organic chemistry methodologies are under development.

A photochemical C(sp3)–H activation methodology is under study. The employment of gaseous alkanes such as propane, ethane and methane are investigated as suitable reagents for valid late-stage modification reactions.



Project goals

Typical MSc projects contain the development of new reactions, reaction optimization and scope investigation. BSc projects typically contain reaction optimization.
Reactions performed in liquid phase as well as gas-liquid multiphase systems are being studied.

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