REPUBLIKA SLOVENIJA
MINISTRSTVO ZA IZOBRAŽEVANJE, ZNANOST IN ŠPORT

Naložba v vašo prihodnost
OPERACIJO DELNO FINANCIRA EVROPSKA UNIJA
Evropski socialni sklad

VABILO NA PREDAVANJE
V OKVIRU DOKTORSKEGA ŠTUDIJA
KEMIJSKE ZNANOSTI

Prof. Dr. Volker Hessel

Micro Flow Chemistry and Process Technology
Eindhoven University of Technology
The Netherlands

z naslovom:

Flow Chemistry and Continuous Process Technology – Novel Process Windows for New Business Windows

v sredo, 21. maja 2014 ob 15:00 uri
v Novi predavalnici, na Fakulteti
za kemijo in kemijsko tehnologijo, Aškerčeva 5

Vljudno vabljeni!

Operacija se izvaja v okviru Operativnega programa razvoja človeških virov za obdobje 2007-2013, razvojne prioritete 3 : »Razvoj človeških virov in vseživljenjskega učenja«; prednostne usmeritve 3.3 »Kakovost, konkurenčnost in odzivnost visokega šolstva«.

REPUBLIKA SLOVENIJA
MINISTRSTVO ZA IZOBRAŽEVANJE, ZNANOST IN ŠPORT

Naložba v vašo prihodnost
OPERACIJO DELNO FINANCIRA EVROPSKA UNIJA
Evropski socialni sklad

Abstract

Micro Process Technology has given strong push to continuous chemical manufacture via facilitating heat and mass transfer (transport intensification). The next big step is to develop a tailored process chemistry in flow under highly intensified conditions – which is one essence among the developing field of Flow Chemistry. This has been coined Novel Process Windows and has two research pillars, – the exploration of unusual and typically harsh process conditions (chemical intensification) and, in a more holistic picture, a completely new and often simpler process design (process-design intensification). Reactivity is boosted via high-T, high-p, high-c (solvent-free; alternative solvent) concepts and more. Recently, biotechnology and flow chemistry merged into enzymatic micro-flow reactors. Enzymes are commonly immobilized on porous beads filled into a tube – a micro-flow packed bed reactor. The making of high-value building blocks for APIs is demonstrated by the formation of alpha amino alcohols with Threonine Aldolase. A transesterification with Lipase underlines how productivity, sufficient at least for pharma level, may be achieved and what bottlenecks are still to overcome in flow biocatalysis. Starting from such new reaction designs, new process designs in flow are developed, with major consequences on CAPEX/OPEX costs, sustainability, and energy consumption (heat integration, pinch analysis). On top of that, the embedment of flow processing into modern compact modular chemical production platforms (‘Future Factories’; container) such as Evonik’s Evotrainer is discussed. Such modern chemical manufacturing allows a faster return on invest by reducing time-to-market (‘windows of opportunity’) especially for high-value chemicals and in volatile markets. First evidence is given by cash-flow analysis, determining the net-present value.