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Homogeneous catalysis in biomass-based solvents

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Solvents are intrinsic part of millions of chemical reactions providing one or more liquid phase(s) and processes such as extraction, filtration, crystallization etc. Thus, the industrial activities using conventional organic solvents are resulting in the release of more than 6 Mt of solvents into the atmosphere in EU-28 annually and some of which are leading to serious environmental concerns. Consequently, the replacement of these conventional organic solvents with green or even renewable-based alternatives could be considered as a key issue in the development of greener and cleaner chemical transformations. The intensive research activities on biomass conversion have led to the identification of novel platform chemicals and some of these could act as alternative non-fossil reaction media for catalysis. It was demonstrated that γ-valerolactone as a renewable, polar, aprotic molecule and its ionic liquid derivatives having low vapor pressure even at high temperatures, low toxicity etc. could be applied as biomass-based alternative reaction media for synthetically important homogeneous catalytic transformations such as hydroformylation, hydrogenation, carbonylation and cross coupling reactions. Our contribution will present homogeneous catalysis in biomass-based solvents including comparison of conventional fossil-based media with ones, optimization of reaction conditions, and investigation of substrate scopes for corresponding catalytic reactions.

Biography

László T Mika received his PhD in organic- and organometallic chemistry at Eötvös University, Budapest, Hungary. He works as an Associate Professor and Head of Laboratory of Catalysis at the Budapest University of Technology and Economics and became the Head of Department of Chemical and Environmental Process Engineering in 2016. His research activity documented by about 40 scientific papers covers different area of green chemistry (biomass conversion, applications of alternative reaction media, and design new catalytic systems).

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