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# VABILO NA PREGLOV KOLOKVIJ / INVITATION TO THE PREGL COLLOQUIUM


## Prof. Dr. Markus Niederberger

Laboratory for Multifunctional Materials, Department of Materials,
ETH Zurich, Wolfgang-Pauli-Str. 10, 8093 Zurich, Switzerland
Email: markus.niederberger@mat.ethz.ch


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**Velika predavalnica Kemijskega inštituta / Lecture Hall at the National Institute of Chemistry; Hajdrihova 19, Ljubljana**

## Liquid-Phase Synthesis of Inorganic Particles, Films and Composites in Organic Solvents


Liquid-phase routes to inorganic functional materials in organic solvents under exclusion of water have become a versatile alternative to aqueous methods. In comparison to the complex aqueous chemistry, nonaqueous processes offer the possibility of better understanding and controlling the reaction pathways on a molecular level, enabling the synthesis of inorganic materials with high crystallinity and well-defined and uniform particle morphologies. A special feature of these routes is that in many cases organic reactions provide the “monomers” for the nucleation of the inorganic particles. The strong relation between these organic reaction pathways and the formation of inorganic particles not only offers a versatile tool to control the morphological characteristics of the particles by varying the organic species in the reaction mixture, but also makes it possible to study particle formation mechanisms through monitoring the organic side reactions. Additionally, organic reactions are very sensitive to microwave irradiation. Therefore, the combination of nonaqueous processes with microwave chemistry potentially provides a way to control the formation of inorganic particles through influencing the organic reaction pathways by microwave irradiation.

Based on ZnO as an example we will discuss, how nanoparticle formation and growth under microwave irradiation can be described by combining kinetic analysis of the precursor consumption with the crystal growth. These results are of high practical relevance, because they allow a precise tuning of the crystal size and a highly efficient doping of the metal oxides with transition metals. Furthermore, we will address nanopowder processing into thin films and nanocomposites, as well as selected potential applications in gas sensing devices and battery technology.


Vljudno vabljeni! / Kindly invited!

info: dr. Zorica Crnjak Orel; zorica.crnjak.orel@ki.si