



e-conversion



Seminarankündigung

**Dienstag, 9. November 2021
13:00 Uhr**

**WSI, Seminarraum S 101
also ONLINE via ZOOM**

<https://tum-conf.zoom.us/j/63210679333>

Meeting-ID: 632 1067 9333

Kenncode: 075076

“Materials, electrodes and devices for (photo)electrochemical production of fuels and high added-value chemicals”

The development of sustainable strategies for the production of added-value chemicals and fuels using renewable resources is particularly attractive to promote a transition towards a more sustainable energetic landscape, overcoming the dependence of fossil fuels at a global scale. One of the most promising alternatives involves the use of renewable electricity (wind, solar, hydropower, etc...) to power electrochemical conversion processes, which convert abundant molecules (e.g., water, carbon dioxide, and nitrogen) into higher-value products (e.g., hydrogen, hydrocarbons, oxygenates, and ammonia). In all these processes, electrocatalytic or photoelectrocatalytic water oxidation stands out as the preferred reaction to provide the protons and electrons needed for the target reduction reactions. In this context, metal oxides of earth-abundant elements (Fe, Ni, , etc...) are identified as excellent candidates, since these materials can fulfil most of the needed requirements for (photo)electrochemical water oxidation, although in some cases their performance should be improved for a more realistic technological assessment. On the other hand, a clear mechanistic understanding of the physical-chemical processes taking place during operation is essential. In the present seminar, we will address different examples of metal oxides (mainly NiOx) for electrochemical water oxidation and other photoactive materials (metal oxides and halide perovskites) combined with catalytic layers, emphasizing the mechanistic insights leading to enhanced performance. Our studies focus on the correlation of the (photo)electrochemical response of the materials with a detailed structural, optoelectronic and photoelectrochemical characterization carried out by different microscopic and spectroscopic tools.

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