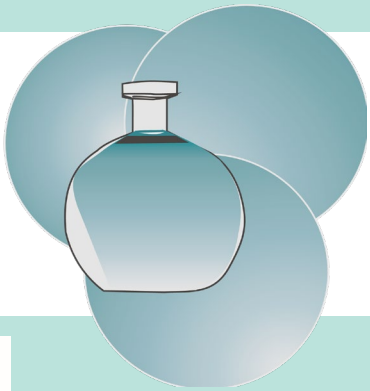
Fakultät für Naturwissenschaften

Institut für Chemie



lädt ein

gemeinsam mit der Gesellschaft Deutscher Chemiker zum

GDCh
GESELLSCHAFT DEUTSCHER CHEMIKER

Vortrag

von Herrn

Prof. Christoph Rameshan

Chair of Physical Chemistry
Montanuniversität Leoben
Österreich

"Perovskite Oxides – A Materials Playground for Catalytic Energy Conversion Applications"

am: 25. April 2024

um: 16:00 Uhr

wo: im Raum 1/232

Die kleine Kaffeerunde vor dem Vortrag beginnt um 15:30 Uhr im Raum 1/232.
Das Mitbringen von eigenen Trinkgefäßen ist erwünscht.

Gäste sind herzlich willkommen!

TECHNISCHE UNIVERSITÄT
IN DER KULTURHAUPTSTADT EUROPAS
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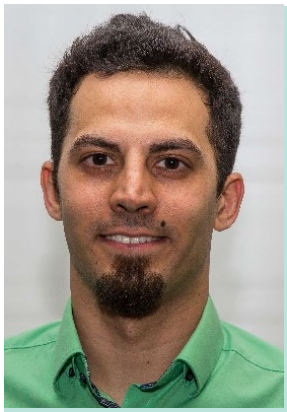

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"Perovskite Oxides – A Materials Playground for Catalytic Energy Conversion Applications"

Perovskite oxides with their general structure ABO_3 are an extremely versatile material class. They are stable at high temperatures even under harsh environments. Both A- and B-site of the host lattice can be doped, enabling a materials design approach (e.g., for utilization as electrode material, solar cell, catalyst or gas sensor). For our particular materials, their catalytic properties are optimized for catalytic and electrocatalytic applications. Additionally, perovskite oxides can exsolve B-site cations under reducing conditions (i.e. the growth of finely dispersed nanoparticle on the surface). This feature makes them particularly interesting as novel catalyst materials for high temperature reactions.

In our work we highlight how we can tune the composition of different perovskites to optimize their surface and bulk properties. By a combination of spectroscopic (in-situ) characterization with theoretical calculations we can understand their specific properties. Especially the rich oxygen surface chemistry of these novel materials makes them interesting for catalytic applications. Our focus is on high temperature reactions for the (electro)catalytic transformation of CO_2 into valuable products. Their thermal stability and oxygen surface chemistry makes them ideal materials for reverse water gas shift and dry reforming. Furthermore, the direct electrocatalytic reduction of CO_2 to CO is a promising route for CO_2 utilization. Furthermore, perovskites can prevent some of the major problems of catalyst deactivation. The sintering of active nanoparticles and the deactivation by coke formation.

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