CatLab

CATALYSIS LABORATORY

CatLab Lecture Series hosted by FHI and HZB

## Friday, January 12th 2024, 10:30-12:00

BESSY II, Seminar Room at the Entrance, Albert-Einstein-Straße 15, Berlin Adlershof


## Regina Palkovits

Max Planck Institute for Chemical Energy Conversion, Mülheim an der Ruhr
RWTH, Aachen


# Heterogeneous Catalysis as Enabler of Circular Economy

The guidelines of sustainable development require a transformation of today's linear chemical industry with the aim of closed carbon cycles. In this process, renewable energy can be used as an energy/heating source and to provide chemical redox equivalents, e.g. in the form of hydrogen or electrons. Catalysts are essential to enable selective chemo-, bio-, or even electrocatalytic reactions under the dynamic supply of resources. As carbon sources, fossil raw materials must be used as carbon efficiently as possible in a transition phase and consistently replaced by renewable carbon sources such as $CO_2$ and biomass, as well as recycling streams, e.g. in the form of plastics. Catalysts enable raw materials that are highly diverse in functionality and reactivity to be selectively converted and efficient value chains to be developed aiming to realize overall energy-efficient carbon cycles. In particular, chemical energy storage molecules that allow transport and storage of renewable energy will gain importance and strengthen the coupling of the chemical and energy sectors.

Herein, novel concepts in catalyst design will be discussed focusing on solid molecular catalysts for $CO_2$ activation, novel biomass transformations and the contribution of catalysis in life cycle assessment as well as the future role of a potentially electrified (bio)refinery.


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