# Catalytic Interfaces for Sustainable Chemical Energy Carriers

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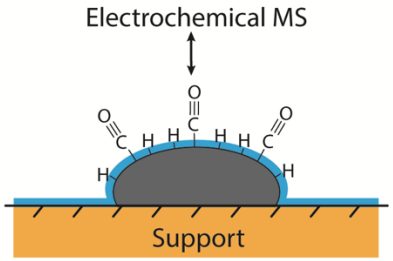
Our research interests focus on gaining a fundamental understanding on how electrochemical polarization effects impact reactions without nominal charge transfer. Specifically, we will measure adsorbate coverages on polarized catalyst surfaces and ultimately unveil the influence of applied polarization on reaction kinetics and the selectivity of catalytic transformations of sustainable energy carriers. In addition, we will measure non-equilibrated ion distributions and ion transport kinetics in electrochemical systems by experimental means.

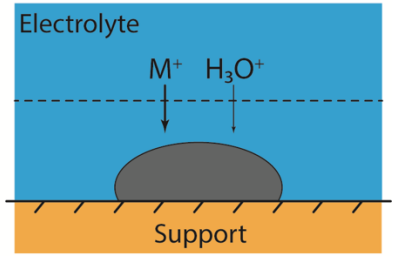
We will leverage this fundamental insight to design improved catalytic technologies for the thermochemical conversion of small molecules like CO, $CO_2$ and $N_2$ and the development of improved electrochemical technologies. A particular focus in our group will be the interconversion of chemical energy storage compounds related to $H_2$.

## Catalytic Interfaces

**E-dependent adsorption behaviour**

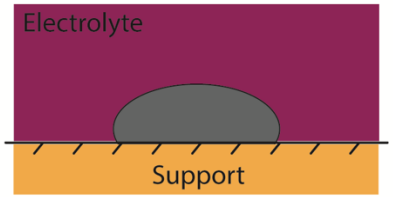



**Non-equilibrated ion transport**

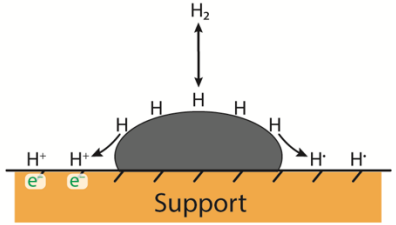



**Non-conventional electrolytes**

T = 150 - 1500 °C




**Charge transfer relevant to thermochemical catalysis**




Questions? **m.huelsey@tum.de**