



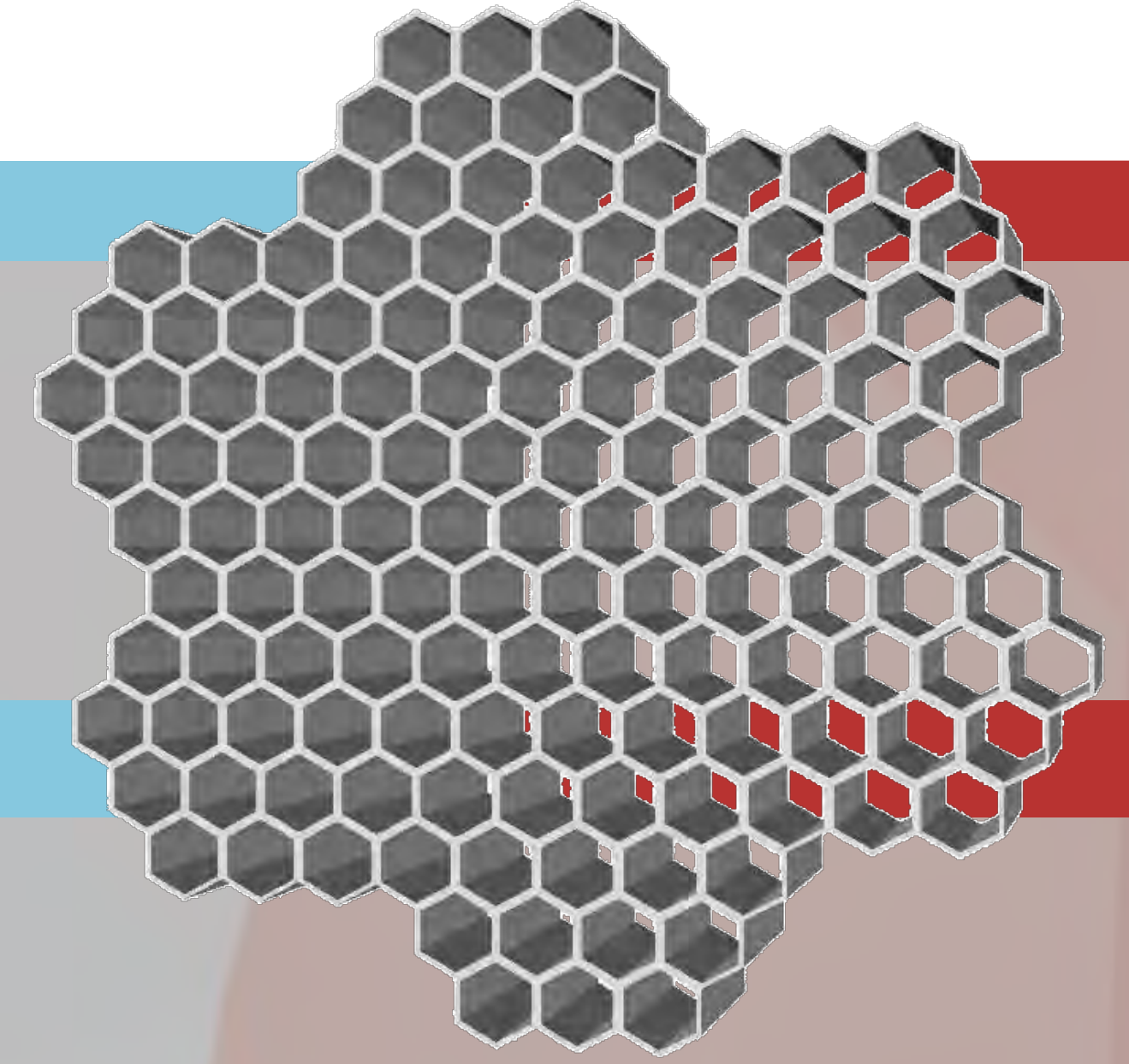
# Professorship of Heterogeneous Catalysis Institute of Chemical Technology

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## Our Profil

Focus on investigation of novel materials with defined porosity on multiple length scales for sustainable catalysis.



## Our Competences

### Heterogeneous Catalysis

The catalysts with defined pore systems are investigated in different technical relevant catalytic reactions to correlate material properties with catalytic behavior and gain insight into intelligent catalyst design. Multiple reaction setups with different pressure (1-200 bar) and temperature (25-1000 °C) ranges available

CO<sub>2</sub> Hydration      Synthetic Exhaust Gas Apparatus  
PhenOle      SCR-DeNOx  
Hydroisomerization

### Advanced Characterization

Characterization of porous materials by standard methods and advanced techniques can be performed to get insight into material properties and mechanisms of catalytic reactions

Temperature Programmed Desorption (TPD)  
TEM tomography      PFG-NMR

### Synthesis

Materials with mono or multimodal micro-, meso- and/or macropore systems are synthesized as powders or monoliths and loaded with different catalytically active species.

Monoliths      Spheres  
Hierarchical Materials

## Our Research Fields

### Utilization of renewable resources

Investigation of novel multifunctional catalysts and heterogeneous catalyzed processes for the efficient conversion of renewable feedstocks for the sustainable production of valuable chemical materials.

CO<sub>2</sub> Utilization      Biomass Feedstocks      Photocatalysis

### Conversion of exhaust gas components

Heterogeneous catalytic conversion of air pollutants and harmful exhaust gas components from combustion processes.

Diffusion studies

Investigations on mass-transfer in complex catalytic and pore systems

probe molecule concentration

time

### Innovative Catalytic Systems

Innovative approaches to challenges in current fields of heterogeneous catalysis, such as harsh process conditions, energy efficiency, stability, mass transfer efficiency, bifunctionality or recycling.

Monolithic catalytic reactors      Immobilization of Organocatalysts

Zeolites for Hydrogen Isotope Separation

## Selected Publications:

- Khan, A.; Goepel, M.; Colmenares, J. C.; Gläser, R. ACS Sustainable Chemistry & Engineering, 8 (12) (2020) pp. 4708-4727
- S. Weber, K. L. Abel, R. T. Zimmermann, X. Huang, J. Bremer, L. K. Rihko-Struckmann, D. Batey, S. Cipiccia, J. Titus, D. Poppitz, C. Kubel, K. Sundmacher, R. Gläser, T. L. Sheppard, Catalysts 10 (2020) 1471
- C. Chmelik, M. Liebau, M. Al-Najji, J. Möllmer, D. Enke, R. Gläser, J. Kärger, ChemCatChem 10 (2018) 5602-5609



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