PhD position in Physical Chemistry

A PhD position in Physical Chemistry is available from 01.10.2023 at the Christian-Albrechts-University of Kiel, Germany. The position is for limited period of 3 years. The regular weekly working hours are 50% of a full employment (19.35 h). The salary of the Ph.D. position is based on the German federal public service scale (class 13 TV-L).

In the group of “Model Heterogeneous Catalysis and Functionalized Interfaces”, a broad range of surface sensitive methods is applied to obtain an atomistic-level understanding of the structure, chemical composition and reactivity of well-defined model heterogeneous catalysts and functionalized interfaces. We are aiming at developing new concept towards rational design of new catalytic materials with tailor-made properties, such as e.g. high selectivity in multi-pathway surface reactions.

The main focus of the research project:

Model heterogeneous catalysis on functionalized interfaces: atomistic-level understanding and development of new catalytic materials

lies at an atomistic-level understanding of ligand-directed heterogeneous catalysis occurring at the metal surfaces functionalized with organic ligand assemblies.

The selectivity of multi-pathway surface reactions depends on subtle differences in the activation barriers of competing reactions, which is difficult to control. One of the most promising strategies to overcome this problem is to introduce a specific selective interaction between the reactant and the catalytically active site, directing the chemical transformations towards the desired route. This interaction can be imposed via functionalization of a catalyst with organic molecules, promoting the desired pathway via steric constrain or electronic effects.

In this project, a unique combination of surface-sensitive methods will be applied on well-defined functionalized model catalysts - both on metal single crystals and on supported metal nanoparticles - in order to investigate the fundamentals of heterogeneous catalysis on functionalized interfaces at the atomic level. A combination of molecular beam methods and scanning tunneling microscopy will be employed to enable structural characterization and chemical identification of the surface species as well as controlled kinetic studies. The chemical and geometric structure of the functional layer will be systematically changed in order to specifically influence the steric hindrance and the electronic effects. The exact correlations between the properties of the functional layer and the mechanisms and kinetics of the surface reactions will be established.

Qualification requirements

You should hold a Diploma or Master’s degree in Physical Chemistry. Practical experience in the field of surface chemistry, molecular beam methods and/or scanning tunneling microscopy are advantageous. You should have practical experience with (ultra) high vacuum technology.

Kiel University aims at increasing the number of women in research and academic teaching and strongly encourages applications of accordingly qualified women. Women will be preferred, provided equal qualifications and scientific performance.

The CAU supports the employment of severely disabled persons. Therefore, severely disabled persons will be preferred, provided equal qualifications and scientific performance.
Applicants with a migration background are particularly welcomed.

Please send your application documents by e-mail (pdf file including a cover letter, CV, copies of certificates, and a short abstract of the Diploma or Master’s thesis) until **25.08.2023**, to Prof. Dr. Swetlana Schauermann, schauermann@pctc.uni-kiel.de

Further information on the group and the project can be found at [https://www.schauermann.phc.uni-kiel.de/en/](https://www.schauermann.phc.uni-kiel.de/en/)

Please refrain from submitting application photos.