

In-situ transmission electron microscopy study of methanol steam reforming catalysts

Our Institute:

The Ernst Ruska-Center for Electron Microscopy and Spectroscopy with Electrons (ER-C) is a world leading institute for high-resolution transmission electron microscopy. The institute is well respected for its pioneering work on aberration correction in electron optics, for its unique facilities and equipment, and the large number of state-of-the-art microscopes. Currently, the ER-C operates six aberration-corrected high-resolution electron microscopes and five conventional electron microscopes. Located at the Forschungszentrum Jülich campus, the ER-C offers a highly international and multidisciplinary working environment, with scientific research in the areas of condensed matter physics, energy materials, nanoelectronics, and in the future development of sub-ångström sub-electronvolt microscopy.

Project background:

Efficient catalyst materials hold the key for a breakthrough in future energy conversion and storage. Methanol steam reforming (MSR) is an extremely important reaction for the provision of pure hydrogen for fuel cell applications in the context of a future methanol-based energy industry.

Your work:

We offer a PhD position (3 years) within a project funded by the Deutsche Forschungsgemeinschaft in cooperation with the University Chemnitz. The project focusses on the development, electrochemical, and microstructural characterization of advanced catalyst nanoparticles. You will investigate ZnPd/ZnO catalysts, which have been shown to be very active and selective methanol steam reforming catalysts. The main task of your work will be the microstructural characterization of novel ZnPd/ZnO-based catalysts by aberration-corrected transmission electron microscopy, electron energy loss and energy dispersive X-ray spectroscopy, electron tomography, and in-situ experiments under MSR-atmosphere using a closed-cell gas holder.

Your profile:

- Master degree in physics, chemistry, or materials sciences.
- A high interest in hands-on work and the use of complex advanced microscopy equipment.
- A high level of experimental skills.
- Experience in electron microscopy or electrocatalysis is desired.

We Offer:

- Carrying out research in an international and multidisciplinary environment at one of the leading research facilities for high resolution electron microscopy.
- Strong research interaction with project partners at TU Chemnitz.
- Possibilities to attend national and international conferences.

contact:

Dr. Marc Heggen
m.heggen@fz-juelich.de

Ernst Ruska-Centrum und Peter Grünberg Institut
Forschungszentrum Jülich GmbH
52425 Jülich