



DLR – DAAD Fellowships

Fellowship No. 525

Research Area : Energy

Research Topic: **Advanced Electrochemical Impedance Spectroscopy for Alkaline Electrolyzer Diagnostics**

DLR Institute: Institute of Engineering Thermodynamics, DLR Stuttgart

Position: Postdoctoral Fellow

Openings: 1

Job Specification: Carbon dioxide emissions reduction become increasingly urgent for climate change mitigation. The main key to address this challenge is to use renewable energy sources particularly in the concept of renewable integrations in energy, mobility systems, and industry with Power-to-X solutions using green hydrogen. Germany has set out to become a global leader in the associated hydrogen technologies, and this is due in large part to Germany's ambitious energy transition targets. Alkaline water electrolyser (AWE) is one of the most mature technologies but has still challenges of low current densities and part load capabilities, which need to be addressed. In addition, the investigation of long-term durability of AEW to gain knowledge about the service life of the system under different processing conditions and operating modes are particularly important. In the system point of view, DLR is seeking a strategic positioning towards improving the AWE performance and durability using the optimization of processing conditions under different operating modes. This required a detailed and extensive trace and analysis of system response under different operation conditions. In this regard, electrochemical Impedance spectroscopy (EIS), in combination with performance and durability tests, will provide useful information to quantify the impact of the different operation conditions on the AWE efficiency and stability characteristics. There is an opening for a post-doctoral fellow to work in the area of AWE to operate the system and analyses the system response under different operation conditions using different analysis methods, such as I-V polarization curves, accelerated life tests (ALT) and accelerated stress

tests (AST), and etc. The post-doctoral fellow, runs electrochemical impedance spectroscopy (EIS) extensively as a diagnostic tool and analyses it using mathematical circuit fitting in combination with the aforementioned techniques to quantify the effect of different operation conditions on the performance and durability of AWE reactor.

Required Qualification: Doctorate degree from an accredited university in the area of chemistry, physics, chemical and electrochemical engineering, process engineering, or relevant fields. Must have earlier experience in electrochemical devices development and testing. Advanced knowledge in impedance spectroscopy and analysis are highly required. Experience in operating process engineering systems is important.

Advantageous Skills: Experience of alkaline water electrolyser is a plus; Track record of scientific publication.

English competence: See requirements on www.daad.de/dlr

Fluent spoken and written

Earliest Start Date: As soon as possible

Application Deadline: Until position filled

Further Information: <http://www.dlr.de>
<http://www.daad.de/dlr>