

## **Development of an Electrochemical Sensor for Corrosion Monitoring Geothermal Power Plants**

In geothermal power plants, corrosion is still a pending problem, depending on the chemical composition and aggressivity of the thermal water. Prediction of corrosion attack in service is always tricky since accessibility for inspection usually is not given. Therefore, corrosion is undetected until the occurrence of leakage.

In order to monitor the corrosion status, electrochemical sensors can be used as they are already used for other applications like steel in reinforced concrete. The main challenge for geothermal plants is the high temperature of up to 160°C (320°F), which makes standard cells not applicable. Therefore, it is necessary to modify and validate the sensor with standard sensors in atmospheric conditions.

In this project, the corrosion monitoring of a modified three-electrode will be established, and tests shall be conducted at room temperature conditions. The results will be compared with measurement results carried out with standard equipment. The stability will be determined over more extended measurement periods, and the standard deviation of the measurement errors.

### **Scope of the internship**

The intern prepares the samples and conducts the electrochemical measurements with the standard and adapted electrochemical cell. The corrosion attack at the surface of the samples will be investigated and characterized with the help of microscopic investigations.

The results should be summarized in a presentation and – if possible – published in a scientific paper.

**Qualification level:** Master or advanced Bachelor students with technical, primarily chemical or material, background

**Program lines:** SRI, A2S, BA/MA