



## HiWi/Master Thesis

# O<sub>2</sub> Sensor System: Development of an Optical Detection System for Energy Management

In this master thesis project, a sensing system is to be designed for precise absorbance measurements, and an efficient way of energy storage will be studied.

### Project description

Anthracene endoperoxides is a newly developed molecule that is able to bind oxygen and release it on demand. Those molecules are therefore the perfect candidate to develop energy storage, which can release energy in the form of oxygen to pressurize systems on demand. Equipping the system with a light source we will be able to control the binding. By integrating an optical sensor, the monitoring of the oxygen release will be possible. The combination of the chemical process with a sensing system will result in the creation of a fully innovative self-aware oxygen energy storage. Your task is the development of the optical sensor for monitoring the oxygen release.

### Tasks

- Assembly of a measuring setup and system integration, which mainly includes a sensitive photodetector, light source, microcontroller, and sample handling apparatus.
- Developing protocols for light calibration, optimizing the spectral range, and characterization of absorbance change during reaction progress.
- Designing and executing experiments to record absorbance changes over time.
- Working with electronic setup, measurement analysis, and optimization of the model.

### Expected candidate profile

We are seeking a highly motivated candidate with a background in embedded design, electronics, optics, or related field. Prior experience with test setups, optical instruments, and sensors is an advantage. This project offers a valuable opportunity to gain experience in experimental design, data analysis, and interdisciplinary collaboration.

### Application

If interested, please submit a single PDF containing your motivation and application via email to:

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