Photophysical and electrochemical characterization of nanostructured electrodes for solar water splitting

Research project

In the framework of the PR FESR project SHINE "Solar Hydrogen via Integration of Energy Conversion Technologies", we will characterize photophysical and (photo)electrochemical properties of semiconductor photoanodes (hematite, bismuth vanadate, tungsten trioxide) and dark cathodes in view of their utilization in a photoelectrochemical reactor for water splitting operating under concentrated blue/UV light.

Activity plan

- Characterization of optical absorption spectra in the UV/Vis range
- Photoelectrochemical measurements: chopped linear sweep voltammetry, electrochemical impedance spectroscopy, intensity-modulated photocurrent spectroscopy
- Determination of external quantum efficiency and applied bias conversion efficiency for solar hydrogen generation
- Study how the aforementioned efficiencies depend on the intensity of the incoming solar radiation