

Gaining knowledge about electric cells (i.e. batteries) becomes more and more important, especially since electric cars and portable electronic devices are in high demand and they are still improved upon. All those devices require reliable power source; therefore, manufacturers are insistently looking for ways to better the batteries, make them last longer and charge faster, simultaneously reducing their weight. What happens to the electric cell when it can no longer be used? How it should be stored?

The main objective of this project is understanding processes occurring during long-term usage and storage of electric cells by using microsphere-based fiber-optic sensors with thin ALD ZnO coatings. Fiber-optic sensors are resistant to external factors and their compact size will allow to integrate them easily and effectively with electric cells. By modification of the parameters of the sensors, i.e. alteration of their geometry, microsphere size, or the thickness of ALD ZnO coating, their metrological properties can be optimized, therefore they can be used to investigate various types of electric cells.

Over the duration of the project electric cells and their charging and discharging cycles, aging and degradation will be investigated. The study of stability and degradation of electric cells during long-term usage and storage will allow to better understand those processes and, in turn, contribute to scientific and technological advancement. Figure 1 presents fiber-optic system which will be used to research processes occurring during long-term usage and storage of electric cells.

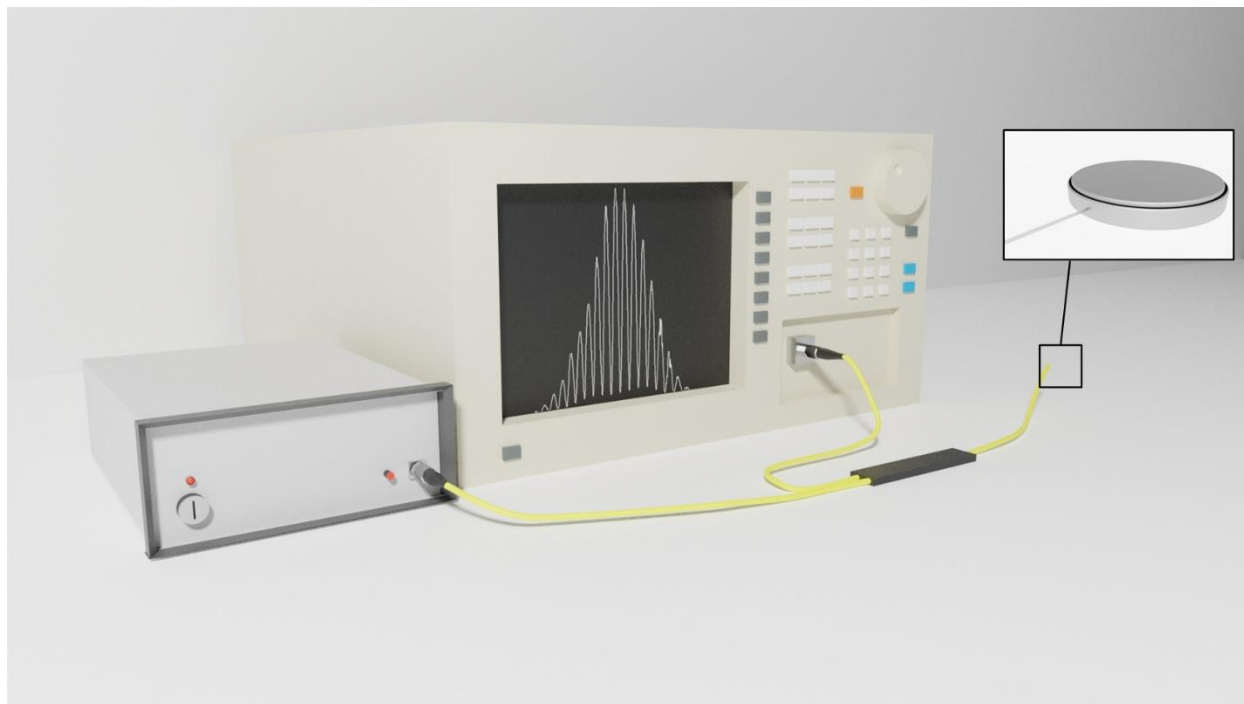


Fig. 1. Fiber-optic system which will be used to research processes occurring during long-term usage and storage of electric cells.