**SYNTHESIS AND PHYSICAL PROPERTIES OF NEW PROTON-CONDUCTING ELECTROLYTES BY DISPERSING HETEROCYCLIC MOLECULES IN LIGHT-CURED POLYMER MATRICES**

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**Project description:**

The need to increase the functionality and efficiency of power sources results from the intensity of development of many areas of our lives, including electromobility. Fuel cells have the opportunity to compete in the automotive market as low-voltage electric sources converting directly chemical energy into electrical one without unnecessary pollution – most often as a result of a hydrogen oxidation reaction. Anhydrous proton-conducting materials with possibly wide temperature range of application (above 100°C) play a key role in the rapid development of these environmentally-friendly electrochemical devices. Incorporation of dispersed heterocyclic molecules as imidazole within appropriate polymer matrices by photopolymerization technique is an innovative approach for searching for new polymer electrolytes for fuel cells and can create a long-range pathway in the material for proton conduction.

**Aim of the project:**

The main goal of the proposed investigations is to develop a preparation of the new proton-conducting materials by dispersing heterocyclic molecules (e.g., imidazole) in light-cured polymer matrices. The specific purpose of the study is characterization of the obtained materials and modification their physical properties to choose the system, which in anhydrous conditions will show electrical conductivity at a level similar to that observed in solid electrolytes important for applications.