The development of the consumer society contributes to an increasing demand for various types of technology. This leads to more and more dynamic and unconditional exploitation of fossil fuels. Some of the effects of these activities are becoming increasingly harmful to the natural environment and, consequently, to health and life of people. Therefore, aspects such as searching for new, alternative energy sources and studies on improving existing ones are extremely important. Chemical power sources are an example of such search. They are devices which convert energy, contained in chemical substrates into electricity. In the simplest terms, a charge or current begins to flow between the electrodes as a result of electrochemical reactions. One of the electrodes undergoes oxidation reactions, while the other - reduction reactions. The presented principle of operation applies to devices used daily by whole societies. These are batteries and cells. Electrochemical capacitors are a slightly different type of chemical power sources, i.e. devices capable to store electric energy by the formation of an electrical double layer at the electrode/electrolyte interface as a result of electrostatic interactions between charges of different characters. The aforementioned electrode reactions are practically non-existent. Due to the fact that activated carbon, characterized by an extremely high specific surface area (even 2500 $m^2/g$), is the electrode material ,the amount of accumulated charge is much higher than in the case of ordinary electrical or electrolytic capacitors. The capacitance of this type of devices is equal to several dozen or even several hundred farads. Due to the lack of electrode reactions, unlike batteries and cells, electrochemical capacitors are characterized by high power values, i.e. they are capable of delivering the previously stored electric charge within a few seconds.

In addition to active electrode materials, steel or metal elements, i.e. current collectors, are also inseparable components of the construction of chemical power sources. Their role is to bring the electric charge to and from the electrodes, and more specifically from the mass of the active electrode material, i.e. the medium which undergoes oxidation and reduction reactions. Current collectors are in constant contact with aggressive electrolyte solutions, without which chemical power sources would not be able to operate. Due to the fact that both metal, steel and electrolyte solution conduct the electric charge, current collectors are permanently subjected to electrochemical corrosion phenomena, which by definition are harmful processes leading to the deterioration of utility properties. This applies mainly to the collector, which is in contact with the electrode undergoing oxidation reactions. In this case, not only the active material but also current collector components pass into the solution in the form of ions. Therefore, it loses its original properties, which in turn leads to a deterioration of working parameters of the entire device.

The aim of this project is to assess the influence of ionic liquid addition to neutral electrolytes and electrode materials on the anti-corrosive properties of current collectors, and thus the working parameters of electrochemical capacitors. The test cells will be subjected to direct and alternate current electrochemical techniques, as well as in-depth physicochemical and surface morphology analysis to perceive any surface changes in both current collectors and electrode materials.