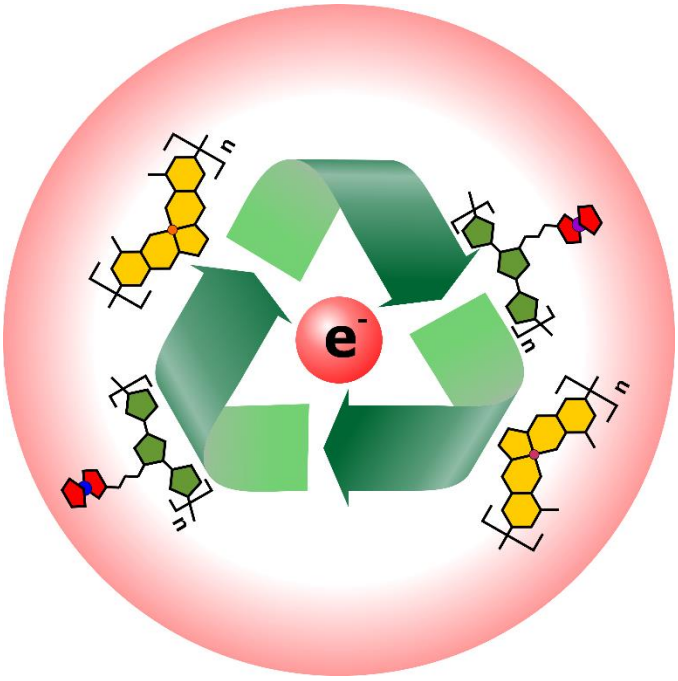
Efforts in chemical catalysis research are now-a-days emphasized on development of catalytic materials that are easy to recover and use after catalytic process. From the point of view of environmental and economic considerations also reusable catalysts are now in demand. Opposite to this, most frequently used catalyst in industrial processes are homogeneous. Moreover, these catalysts contain expensive and toxic metal ions. Therefore, to make synthetic process economically profitable it is necessary that catalyst should increase the yield and the productivity of product substantially high. Beside this, green chemistry require industry to support minimize wastes production, particularly those of substances that contain toxic transition metals which are usually present in these catalysts. Reuse of catalysts is problematic mainly because of need of catalyst separation from products of chemical reaction. One of possible solution can be heterogenization of these homogeneous catalysts. In such heterogenization the catalysts can be immobilized on solid surface.



Toward that, in the current project, we propose electrosynthesis of different heterogeneous catalysts based on metal-containing polymers. Polymer based matrix will be beneficial for the electrochemical synthesis and immobilization of these metal based catalysts. Moreover, porous structure and high surface area of these polymer films will favor their use as supporting material for the development of new electrocatalysts. In case of conducting polymers, because of its relative high electric conductivity, it will be possible to transfer the electrons from the electrode through polymer chains to integrated redox centers, where specifically the electrocatalytic reaction occur. Thus, an efficient heterogeneous electrocatalysis can be fabricated simply by electropolymerization of these materials. The chemical structure of these metal containing polymers will be tuned to improve its electrocatalytic and sensing ability (analytical signal).

Our interdisciplinary pioneering Project combines materials science, polymer and analytical chemistry as well as electrochemistry. The most important result of its implementation will be to gain new knowledge enabling successful development of hetergeneous catalyst.