Catalyst Design and Electrochemical Activation for Fuel cells, Redox Flow Batteries and Electrolyzers

Prof. David Zitoun

Department of Chemistry and Bar-Ilan Institute for Technology and Advanced Materials (BINA), Bar-Ilan University, Ramat Gan, 5290002, Israel

In this lecture, we shall show several examples of electrochemical activation for electrocatalytic generation and conversion of hydrogen in alkaline or acidic conditions. The colloidal syntheses are extremely well adapted to the synthesis of complex catalysts. During the past decade, the quest for sustainability in electrochemical energy conversion and storage has motivated the investigation of electrochemically active materials with a great control on the electrified interface.

In most of the electrochemical devices, the interface between a solid and an electrolyte should promote a high efficiency, selectivity and chemical stability for important reactions like water splitting, fuel electrochemical conversion and chemical storage. The electrocatalysts display a high activity and stability towards hydrogen oxidation/evolution reaction and oxygen evolution/oxidation reaction in acidic or alkaline solutions, even in high concentration of corrosive species.

Bibliography


[5] Direct Chemical Synthesis of Lithium Sub-Stoichiometric Olivine $\text{Li}_{0.7}\text{Co}_{0.75}\text{Fe}_{0.25}\text{PO}_4$ coated with Reduced Graphene Oxide as Oxygen Evolution Reaction Electrocatalyst Yelena Gershinsky, David Zitoun ACS Catalysis, 2018, 8, 8715–8725