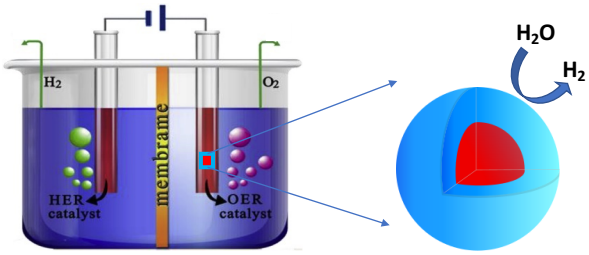
Post-doctoral position in material chemistry - nanoparticle synthesis and electrochemistry -

Project title: Water splitting for hydrogen production promoted by new efficient electrocatalysts based on core-shell nanoparticles combining earth abundant transition metal oxides

Details: Position duration of 18 months. Start before the end of 2022.
This joint research project is funded by the idEx program of the University of Strasbourg and is led by Prof. Benoit P. Pichon (Institute of Physics and Material Chemistry of Strasbourg) in collaboration with Prof. Elena Savinova (Institute of Chemistry and Processes for Energy, Environment and Health)

Context of the project. In the context of global warming and increasing energy consumption, new ways to produce renewable energies with unprecedented performances have to be developed in order to significantly reduce our dependence on fossil energies and greenhouse gas emissions. Although windmills and solar panels are very attractive, wind and sun are intermittent energy sources. In this context, hydrogen emerged as a highly efficient fuel and energy carrier since it allows storing electrical energy into chemical energy with efficient restitution thanks to its high-energy density which is three times that of gasoline (per unit mass). However, most of the hydrogen production originates from natural gas reforming processes which generate carbon dioxide.

Water electrolysis is a very promising environmental friendly alternative way to produce hydrogen. However, it is still hindered by high voltage losses, insufficient durability and noble metals used as electrodes. Therefore, the design of cost-efficient noble metal-free electrocatalytic and conductive materials which accelerate the kinetics of the electrode reactions represents an exciting challenge.



This project aims at developing an original approach to produce hydrogen by water electrolysis promoted by efficient electrocatalysts based on earth-abundant transition metal oxides (TMO). It will consist in the synthesis of nanostructured materials combining two different TMO phases into a core-shell structure - a conductive core and a catalytically active shell - with high specific activity.

Candidate profile. The candidate should hold a PhD in Material Chemistry after January 1st 2017 with a strong background in nanoparticle synthesis. S.He should be already fully trained with wet chemistry techniques such as thermal decomposition of metal complexes and classical analytical methods (TEM, XRD…). Proficiency in electrochemistry/electrocatalysis will be appreciated. We will look for a rigorous, motivated and enthusiastic candidate, with good communication skills and willingness to work in close interaction with their colleagues in an international research group.

Application. Dead line: 30 September 2022. Send by email a detailed CV with full publication list (mentioning the nature and extent of your contributions in the most relevant papers), and a short cover letter. Please specify contact information of three references including your previous advisors (PhD/post-docs) in your CV.

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