Abstract for the general public

In light of the growing plastic pollution on Earth, it is highly desirable to explore feasible methods to recycle waste plastics. However, existing recycling methods are not environmentally friendly, hence, it is highly desirable to recycle the plastic waste into high value-added products. To address above issues, in this project, we propose a feasible method to recycle plastic waste into metal-organic frameworks (MOFs) and the obtained MOFs will be used as OER catalyst for water electrolysis. Most importantly, the performance of PET-derived MOFs is much better than the state of the art OER catalyst-RuO_2. With the implementation of the project, we will not only provide a cost-effective method to prepare OER catalyst, but also present a way to recycle waste PET into high value-added product. The above obtained data will allow us to orientate the future applied research.

Main aims of the project are as follows:

1. It presents a feasible method for recycling of PET into high value added products-MOFs, alleviating the immense environmental pressure caused by massive plastic waste.

2. It provides a cost effective method for the mass production of excellent OER catalyst.

3. It develops a “one stone kill two birds” method that will produce clean energy source-hydrogen by cheap electrocatalyst, in the same time, the waste plastic will be recycled.

4. It shows a feasible method to change pollution or waste products to clean energy and clean air.

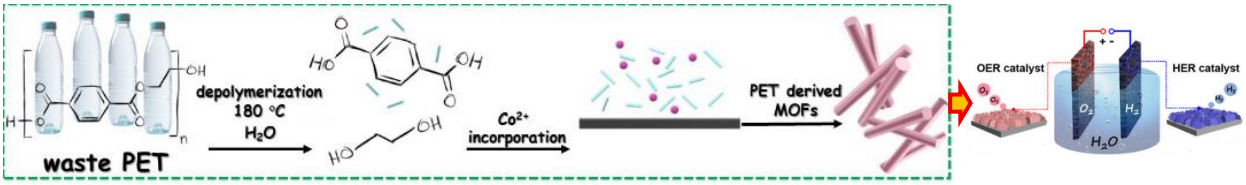

Figure 1. Transformation of waste plastic into MOFs for use as catalysts in water electrolysis