

Bio-inspired strategies for overall CO₂ reduction

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Selective electrochemical reduction of CO₂ into energy-dense organic compounds is a promising strategy for using CO₂ as a carbon source. However, efficient and selective earth abundant metal catalysts for the two reactions typically required for efficient overall CO₂ electrolysis, namely the oxygen evolution reaction (OER) and CO₂ reduction, are still scarce. We will present here the synthesis and electrochemical properties of a rationally designed nanostructured copper/copper oxide electrocatalyst for OER[1], and of a series of nitrogen-doped carbon and copper -based catalysts for the electroreduction of CO₂ under aqueous conditions[2-5] (Figure 1). We will present their combination and use in a flow electrolyzer, and subsequent coupling with inexpensive PV cells.

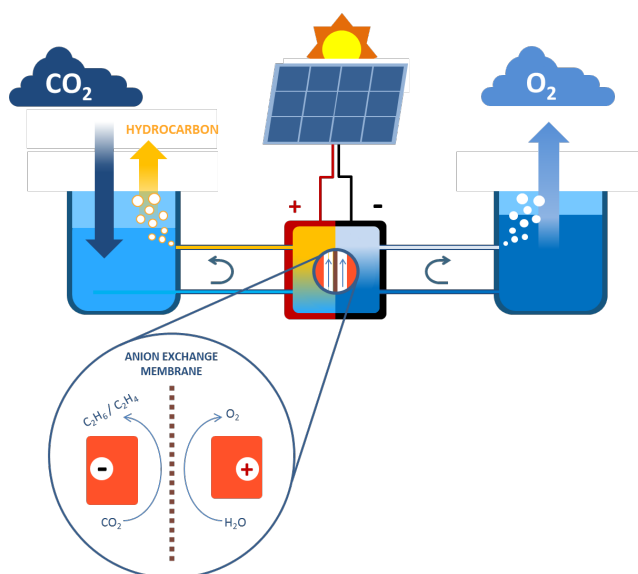


Figure 1: PV-EC system for overall CO₂ reduction.

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