Discussion on the Growth Parameters and Oxygen Evolution Reaction Performance of Copper Sulfide

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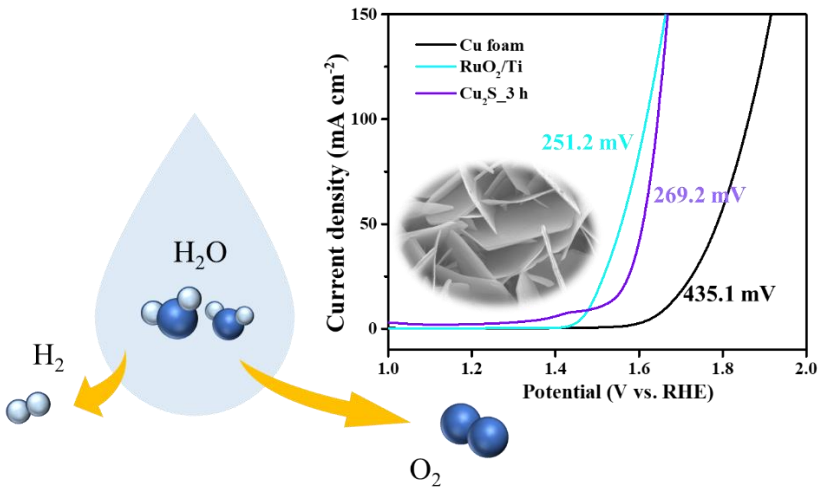
With the advancement of science and technology, energy demand is increasing day by day. People began to look for alternative energy sources in order to solve the problem of insufficient energy. Hydrogen fuel cells have become one of the most notable research projects because of their environmentally friendly and renewable characteristics. One of the cleanest ways to generate hydrogen is through electrochemical water splitting, which can be divided into two parts: Hydrogen evolution reaction (HER) at cathode and oxygen evolution reaction (OER) at anode. Among them, OER is known to be more complicated and thus became the biggest hinder to water splitting.

In this work, Cu_2S microplates were successfully synthesized with non-toxic chemicals via a one-step solvothermal method. The as-prepared samples were then applied as working electrodes for OER electrochemical measurements. The results turned out that the as-prepared Cu_2S/CF electrodes have excellent OER performances with a low overpotential of 269.2 mV (at a current density of 10 mA cm^{-2}) and a Tafel slope of 102.1 mV dec^{-1}. These outstanding results indicated that Cu_2S microplates could be developed as excellent OER electrocatalysts.



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