UH Physics Research Day - 2024



Contribution ID: 42

Type: Talk

NiMo based bifunctional catalysts for water electrolysis

Saturday 24 February 2024 14:24 (12 minutes)

Seawater electrolysis stands as a promising technology for sustainable hydrogen production and desalination. It consists of two processes, Oxygen Evolution Reaction (OER) and Hydrogen Evolution Reaction (HER). A bifunctional catalyst plays the crucial role of performing both these reactions simultaneously thus reducing the cost of this technology. This study focuses on the synthesis and evaluation of a bifunctional catalyst, NiFe/NiMo. Due to the good HER and OER activity of this catalyst, the AEM electrolyzer exhibited a good performance for water electrolysis, achieving a current density of 1000 mA cm^{-2} at 1.87 V. Further experiments under quasi-industrial conditions (6 M KOH & seawater, 60 °C) showed that a three electrolyzer delivered a current density 1000 mA cm^{-2} at a low voltage of 1.63 V. Stability testing of the electrolyzer showed that it exhibited good durability for over 100h. This work presents a general and economic approach towards the development of a bifunctional catalyst for water electrolysis.

Academic year

3rd year

Research Advisor

Dr. Zhifeng Ren

Author: NAIK, Navmi
Co-author: Dr REN, Zhigeng (University of Houston)
Presenter: NAIK, Navmi
Session Classification: Material Science

Track Classification: Condensed Matter Physics