

Nanocomposites and nanomaterials

Catalytic Hydrogen Evolution by NiS_x Nanomaterial at Soft Interfaces

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Inorganic metal sulfide catalysts have extensively been investigated for the Hydrogen Evolution Reaction. Due to its structural and electronic similarities to metal sulfides, NiS_x has also received considerable attention as photoelectrochemical catalysts and electrocatalysts.

Protons can be reduced at these defect free soft electrified interfaces to produce H₂ in the presence of organic reducing agents such as decamethylferrocene (DMFc) in the organic phase [1]. To catalyze this reaction were also studied by our group with some metal sulfide catalysts, which are MoS₂, WS₂ and CoS [2-4]. In this study, we have synthesized NiS_x by modified hydrothermal method. NiS_x nanomaterial was used as a catalyst for the hydrogen evolution reaction by organic electron donor DMFc at the water/DCE bio-membrane like biphasic system. Catalytic behavior of NiS_x on the HER is investigated for the first time at the water-DCE interface. This work opens new perspectives for carrying out artificial photosynthesis at an organic liquid membrane due to the first time use of other metal sulfide compounds in the water splitting reaction at the organic liquid membranes.

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