Library
Indian Institute of Science Education and Research
Mohali

Please use this identifier to cite or link to this item: http://hdl.handle.net/123456789/5133

Title:	Silver Nanocluster/MoS2 Heterostructures for Hydrogen Evolution
Authors:	Gautam, Ujjal K. (/jspui/browse?type=author&value=Gautam%2C+Ujjal+K.)
Keywords:	electrocatalysis molybdenum sulfide nanoflowers silver nanoclusters charge transfer hydrogen evolution reaction
Issue Date:	2022
Publisher:	ACS Publications
Citation:	ACS Applied Nano Materials, 5(5), 7132-7141.
Abstract:	Efficient water splitting through electrocatalysis is one of the most well-accomplished strategies for hydrogen generation. Herein, we design a heterostructure of silver nanoclusters (Ag NCs) coupled with molybdenum disulfide nanoflowers (MoS2 NFs) for electrocatalytic hydrogen evolution reaction (HER). The performance of the hydrogen generation reaction of the Ag/MoS2 heterostructure is 2.3 times higher in comparison to bare MoS2 NFs in acidic media with an early onset potential of −0.09 V vs a reversible hydrogen electrode (RHE) along with a higher current density of 98 mA/cm2 at a potential of 0.43 V vs RHE. The enhanced HER performance is due to the amplified charge-transfer kinetics resulting from electronic interactions between Ag NCs and MoS2 NFs. Lowering the charge-transfer resistance (Rct) in the Ag/MoS2 heterostructure promotes HER kinetics by accelerating the charge-transfer process at the electrode/electrolyte interface. Spectroscopic studies also reveal significant electronic interactions between Ag NCs and MoS2 NFs at the cluster/MoS2 interface. This work explicitly focuses on the pivotal role of Ag NCs in elevating the HER activity due to the facile electronic interactions with MoS2 NFs. It presents an avenue for developing metal nanoclusters coupled with semiconducting materials for HER.
Description:	Only IISER Mohali authors are available in the record.
URI:	https://doi.org/10.1021/acsanm.2c01069 (https://doi.org/10.1021/acsanm.2c01069) http://hdl.handle.net/123456789/5133 (http://hdl.handle.net/123456789/5133)
Appears in Collections:	Research Articles (/jspui/handle/123456789/9)

Files in This Item:

File	Description	Size	Format	
Need To Add…Full Text_PDF. (/jspui/bitstream/123456789/5133/1/Need%20To%20Add%e2%80%a6Full%20Text_PDF.)		15.36 kB	Unknown	View/Open (/jspui/l

Show full item record (/jspui/handle/123456789/5133?mode=full)
(/jspui/handle/123456789/5133/statistics)

Items in DSpace are protected by copyright, with all rights reserved, unless otherwise indicated.