

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : PROSIDING

Judul Karya Ilmiah (Prosiding) : **Surface Modifications Of Chalcopyrite CuInS₂ Thin Films for Photochatodes in Photoelectrochemical Water Splitting Under Sunlight Irradiation**

Nama/ Jumlah Penulis : **Gunawan/5**

Status Pengusul : Penulis ke-1

Identitas Prosiding :

- a. Judul Prosiding : IOP Conference Series: Materials Science and Engineering
- b. ISBN/ISSN : 17578981 atau 1757899X
- c. Thn Terbit, Tempat Pelaks. : 2016, Purwokerto
- d. Penerbit/Organiser : IOP Publishing
- e. Alamat Repository/Web : <https://iopscience.iop.org/journal/1757-899X>
Alamat Artikel : <https://iopscience.iop.org/article/10.1088/1757-899X/172/1/012021>
- f. Terindeks di (jika ada) : SJR (Scimago Journal & Country Rank)

Kategori Publikasi Makalah : ☒ Prosiding Forum Ilmiah Internasional
(beri ✓ pada kategori yang tepat) ☐ Prosiding Forum Ilmiah Nasional

Hasil Penilaian Peer Review :

Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional 30	Nasional 	
a. Kelengkapan unsur isi prosiding (10%)	3		3
b. Ruang lingkup dan kedalaman pembahasan (30%)	9		8
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9		8
d. Kelengkapan unsur dan kualitas terbitan /prosiding (30%)	9		9
Total = (100%)	30		28
Nilai Pengusul =			

Catatan Penilaian artikel oleh Reviewer:

1. Kesesuaian dan kelengkapan unsur isi jurnal:

Artikel yang dimuat sesuai dengan kepakaran penulis. Isi unsur jurnal lengkap sesuai yang dipersyaratkan oleh jurnal internasional (IOP Conference Series: Materials Science and Engineering). Dengan similarity sangat baik (13%).

2. Ruang lingkup dan kedalaman pembahasan:

Ruang lingkup jurnal ini tentang modifikasi permukaan dari lapis tipis kalkopirit CuInS₂ untuk fotokatoda dalam pemecahan air secara fotoelektrokimia dengan cahaya matahari. Pembahasannya cukup mendalam dengan menggunakan instrumentasi pengujian yg sangat baik, tetapi kajian EDX di metoda tidak muncul di pembahasan. Pembahasannya disertai referensi yang menguatkan data yang diperoleh.

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

Data/informasi yang disampaikan cukup baik dan mutakhir dan metodologinya disampaikan secara detil sehingga peneliti lain bisa mengacu penelitian ini. Referensi yang digunakan up to date (43% referensi kurang dari 5 th artikel terbit)

4. Kelengkapan unsur dan kualitas terbitan:

Unsur artikel lengkap, kualitas jurnal sesuai standar IOP Conference Series: Materials Science and Engineering, terideks scopus.

Semarang, 25 Juli 2021

Reviewer I



Prof. Dr. Dra. Meiny Suzery, M.S.
NIP. 196005101989032001
Unit Kerja :FSM Universitas Diponegoro
Bidang Ilmu: Kimia Organik

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Nama/ Jumlah Penulis : **Gunawan/5**

Status Pengusul : Penulis ke-1

Identitas Prosiding :

- a. Judul Prosiding : IOP Conference Series: Materials Science and Engineering
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Hasil Penilaian *Peer Review* :

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	Internasional 30	Nasional 	
a. Kelengkapan unsur isi prosiding (10%)	3		3
b. Ruang lingkup dan kedalaman pembahasan (30%)	9		8,5
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9		9
d. Kelengkapan unsur dan kualitas terbitan /prosiding (30%)	9		8,5
Total = (100%)	30		29
Nilai Pengusul = 0,6 x 29 = 17,4			

- Kesesuaian dan kelengkapan unsur isi jurnal:**
 Artikel sesuai dengan kepakaran penulis, lengkap unsur dalam isi jurnal (4) yaitu judul, abstrak (berisi latar belakang, metode dan hasil), Grafik dan tabel disitasi dan dibahas, penulisan sesuai dengan panduan IOP Conference Series: Materials Science and Engineering. Kelengkapan jurnal meliputi editor, anggota, reviewer, petunjuk penulisan juga ada. Tata penulisan terjadi cukup baik (3)
- Ruang lingkup dan kedalaman pembahasan:**
 Ruang lingkup artikel terkait untuk meneliti penelitian tentang modifikasi Permukaan lapis tipis **Chalcopyrite CuInS₂ untuk Photochatodes in Photoelectrochemical Pemecah Air di bawah Radiasi Sinar matahari**, pembahasan penelitian sudah dilakukan dengan cukup mendalam dalam membahas nya dengan instrumen XRD, SEM, beberapa pengujiannya adalah evolved gas vs waktu, current density vs waktu, ABPE vs waktu, %IPCE vs panjang gelombang, EDX yang disebut dalam methods tidak dilakukan,. (8,5)
- Kecukupan dan kemutakhiran data/informasi dan metodologi:**
 Referensi yang digunakan menunjang pembahasan dan metodologi yang digunakan uptodate (43% referensi dengan tahun terbit sebelum 5 tahun artikel ini terbit (2017) dari 23 jurnal. Metodologi singkat telah ditulis dan dibahas (9)
- Kelengkapan unsur dan kualitas terbitan:**
 Secara umum kelengkapan unsur artikel lengkap. Kualitas jurnal IOP Conference Series: Journal of Physics: Conference Series yang diterbitkan oleh IOP Publishing terindex di Inspec, Scopus serta scimago dengan SJR 0,2 (2017), (8,5)
Catatan: Turnitin 13%

Semarang, 2 Februari 2021
 Reviewer II

Prof. Dr. M. Cholid Djunaidi, S.Si, M.Si
 NIP. 197007021996031004
 Unit Kerja :FSM Universitas Diponegoro
 Bidang Ilmu: Kimia Analitik

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HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING

Judul Jurnal Ilmiah (Artikel) : **Surface Modifications Of Chalcopyrite CuInS₂ Thin Films for Photochatodes in Photoelectrochemical Water Splitting Under Sunlight Irradiation**

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(beri ✓ pada kategori yang tepat) ☐ *Prosiding* Forum Ilmiah Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi prosiding (10%)	3	3	3
b. Ruang lingkup dan kedalaman pembahasan (30%)	8	8.5	8.25
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	8	9	8.5
d. Kelengkapan unsur dan kualitas penerbit (30%)	9	8.5	8.75
Total = (100%)	28	29	28.5
Nilai untuk Pengusul : 0.6x28.5=17.1			

Reviewer 1



Prof. Dr. Dra. Meiny Suzery, M.S.
NIP. 196005101989032001
Unit Kerja :FSM Universitas Diponegoro
Bidang Ilmu: Kimia Organik

Semarang,

Reviewer 2



Prof. Dr. M. Cholid Djunaidi, S.Si, M.Si
NIP. 197007021996031004
Unit Kerja :FSM Universitas Diponegoro
Bidang Ilmu: Kimia Analitik



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IOP Conference Series: Materials Science and Engineering
 Volume 172, Issue 1, 17 February 2017, Article number 012021
 11th Joint Conference on Chemistry, JCC 2016, in Conjunction with the 4th Regional Biomaterials Scientific Meeting; Purwokerto; Indonesia; 15 September 2016 through 16 September 2016; Code 126603

Surface modifications of chalcopyrite CuInS₂ thin films for photoanodes in photoelectrochemical water splitting under sunlight irradiation (Conference Paper)

[\(Open Access\)](#)

Gunawan^a ✉, Haris, A.^a, Widiyandari, H.^b, Septina, W.^c, Ikeda, S.^d

^aChemistry Department, Faculty of Sciences and Mathematics, Diponegoro University, Semarang, Indonesia^bPhysics Department, Faculty of Sciences and Mathematics, Diponegoro University, Semarang, Indonesia^cUniversity of Zurich, Switzerland[View additional affiliations](#) ∨

Abstract

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Copper chalcopyrite semiconductors include a wide range of compounds that are of interest for photoelectrochemical water splitting which enables them to be used as photoanodes for H₂ generation. Among them, CuInS₂ is one of the most important materials due to its optimum band gap energy for sunlight absorption. In the present study, we investigated the application of CuInS₂ fabricated by electrodeposition as photoanodes for water splitting. Thin film of CuInS₂ chalcopyrite was formed on Mo-coated glass substrate by stacked electrodeposition of copper and indium followed by sulfurization under H₂S flow. The films worked as a H₂ liberation electrode under cathodic polarization from a solution containing Na₂SO₄ after loading Pt deposits on the film. Introduction of an n-type CdS layer by chemical bath deposition on the CuInS₂ surface before the Pt loading resulted appreciable improvements of H₂ liberation efficiency and a higher photocurrent onset potential. Moreover, the use of In₂S₃ layer as an alternative n-type layer to the CdS significantly improved the H₂ liberation performance: the CuInS₂ film modified with In₂S₃ and Pt deposits worked as an efficient photocathode for photoelectrochemical water splitting. © Published under licence by IOP Publishing Ltd.

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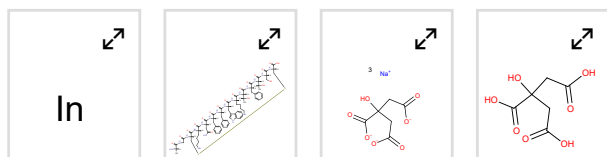
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Co-Modification with Cost-Effective Nickel Oxides and Nickel Sulfides on CuInS₂ Nanosheets Photocathode for Enhanced Photoelectrochemical Performance

Liu, Z. , Zhou, M.
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Tuc Altaf, Ç. , Demirci Sankir, N.
(2019) *International Journal of Hydrogen Energy*

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uncontrolled terms

Chalcopyrite semiconductor Chemical-bath deposition Coated glass substrates
Liberation performance Onset potential Photoelectrochemical water splitting
Sunlight irradiation Water splitting

Engineering main
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Thin films

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Investigation of the Electric Structures of Heterointerfaces in Pt- and In₂S₃-Modified CuInS₂ Photocathodes Used for Sunlight-Induced Hydrogen Evolution

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(2015) *ACS Applied Materials and Interfaces*

Investigation on stability of electroplated-sulfurized CuInS₂-based photocathode modified with an In₂S₃ layer for H₂ evolution under various pH conditions

Gunawan , Haris, A. , Widiyandari, H.
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Accepted papers received: 25 January 2017

Published online: 17 February 2017

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Preface

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Interlayer free – nickel doped silica membranes for desalination

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Abstract. This work shows for the first time the potential of nickel oxide silica membranes for desalination applications. Nickel oxide silica xerogels were synthesised via a sol–gel method including TEOS, nickel nitrate with and without addition of hydrogen peroxide. The effects of nickel addition (5% - 50 mol %) on the structure–property relationship of the silica materials were systematically studied. The membrane performance were tested as a function of feed salt concentration (0.3–3.5 wt% NaCl) and temperature (27–60 °C). The membranes which were prepared using equal sol–gel conditions to the xerogel samples showed the raised feed temperatures resulted in increased water fluxes, whilst increasing the salt concentration resulted in decreased water fluxes. The membranes with addition of hydrogen peroxide exhibited better performances than their H₂O₂ absence counterpart. The salt rejection was in excess of 90% and the maximum flux observed was 7.3 kg m⁻² h⁻¹ at 60°C for a 0.3 wt% NaCl feed concentration.

Introduction

The world is facing a global water crisis due to population growth and climate change [1]. With increasingly limited water resources, the use of infinite number of sea water becomes one choice in the provision of clean and fresh water, hence the desalination technology is one of solution[2]. Currently, approximately 43.5% of the desalination systems in the world are still using thermal technology. Membrane technology becomes an alternative instead of thermal desalination [3] because it uses less energy and produce greater water fluxes. In commercial applications, the polymeric membrane are still dominating the market despite of the polymeric membranes have some limitations, especially in their thermal and chemical stability, hence some researchers tried to find a new alternative using inorganic membranes [4-10]

There are two types of inorganic membranes that have been tested for molecular sieve application, zeolite membranes and silica membranes. In general, silica membranes are developed primarily for gas separation [11, 12]. However, some studies have shown that silica membranes coated on alumina support could reject salt ranging from 92% to 99% [8, 10, 13-15]. However, one of the main obstacles in using silica membranes for water purification is due to their hydro instability. To overcome this



Dimethylaminodiethylenetriamine Derivatives of Fluorescence Chemosensor for Detection of Zn^{2+} In Aqueous Solution

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Abstract. Fluorescent chemosensors for the detection and measurement of metal ions, especially for cations environmental interest such as Fe^{3+} , Co^{2+} , Mn^{2+} , Cu^{2+} , and Zn^{2+} are actively investigated because it shows simplicity, high sensitivity and fast response. New benzenyl derivative bearing pyridine group has been synthesized and studied as fluorescent chemosensor for Zn^{2+} ion. Chemosensor N-{2-[(4-Dimethylamino-benzylidene)-amino]-ethyl}-N'-pyridin-2-ylmethylene-ethane-1,2-diamine was synthesized by condensation of *p*-dimethylaminobenzaldehyde, diethylenetriamine and *o*-pyridinecarbaldehyde and characterized by FT-IR, ¹H-NMR and elemental analysis (CHN). FT-IR showed the appearance of peak azomethine (C=NH) at 1639.46 cm^{-1} , pyridine (C-N) at 1591 cm^{-1} and disappearance of NH_2 peak at 3278.78 cm^{-1} after the condensation reaction in between aldehyde and amine. ¹H-NMR signal at 8.19 ppm, 3.12 ppm and 8.08 ppm was assigned to C=NH, $\text{N}(\text{CH}_3)_2$ and C-N respectively, confirmed the formation of N-{2-[(4-Dimethylamino-benzylidene)-amino]-ethyl}-N'-pyridin-2-ylmethylene-ethane-1,2-diamine. The elemental analysis was found closed to the theoretical value and the percent composition of A is 91.82%. Sensor A exhibits high selectivity and sensitivity towards Zn^{2+} . Other metal ions such Cu^{2+} , Fe^{3+} , Co^{2+} and Ni^{2+} had no such significant effect on the fluorescence. The detection limit of N-{2-[(4-Dimethylamino-benzylidene)-amino]-ethyl}-N'-pyridin-2-ylmethylene-ethane-1,2-diamine for Zn^{2+} was 3.5×10^{-5} M. This sensor exhibits a very good fluorescence sensing ability to Zn^{2+} over a wide range of pH. Therefore it is capable of being a practical system for the monitoring of Zn^{2+} concentrations in real water sample.

1. Introduction

Zinc is the second most abundant transition metal ion in the human body, it plays an indispensable role in various biological activities such as gene expression, neural signal transmission, regulation of metalloenzymes, and DNA binding or recognition [1]. However, excessive amounts of zinc in human cause many severe diseases such as Alzheimer's disease [2], ischemic stroke [3] and epilepsy [4]. Hence it is very important to develop highly selective and sensitive chemosensors for the detection of Zn^{2+} in the environment as well as biological samples.

Owing to its essential roles in biological nutrition systems, the measurement of Zn^{2+} is an active field in analytical chemistry. Compared with numerous traditional analytical techniques, fluorescence molecule sensor display high sensitivity, selectivity, simplicity, and tunability thus have been developed as a powerful tool for detecting the trace amount of analytes. Chemosensors are commonly composed of two parts, a receptor (recognition element) responsible for the molecular recognition of

