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HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : JURNAL ILMIAH

Judul Artikel Ilmiah : TiO₂-PDMS Super Hydrophilic Coating with Self-Cleaning and Antimicrobial Properties

Penulis Artikel Ilmiah : **Dessy Ariyanti**, Afiatin, Pury Diana Shintawati, Aprilina Purbasari

Status Pengusul : Penulis utama

Identitas Jurnal Ilmiah :

- a. Nama Jurnal : Jurnal Kimia Sains dan Aplikasi
- b. ISSN : ISSN: 1410-8917, e-ISSN: 2597-9914
- c. Nomor/Volume/Hal : 6/24/192-199
- d. Edisi (bulan/tahun) : 2021
- e. Penerbit : Department of Chemistry, Diponegoro University
- f. Jumlah halaman : 8 halaman
- g. DOI artikel (Jika ada) : <https://doi.org/10.14710/jksa.24.6.192-199>
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d. Kelengkapan unsur dan kualitas penerbit (30%)	7,50	6,50	7,00
Nilai Total = (100%)	24,80	22,00	23,40
Nilai pengusul = (0,6 x nilai total)	14,88	13,20	14,04

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- h. Alamat web Jurnal : <https://ejournal.undip.ac.id/index.php/ksa/article/view/392>
- i. Terindeks di : SINTA 2
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Komponen Yang Dinilai	Nilai Maksimal Karya Ilmiah (isikan di kolom yang sesuai)			Nilai Akhir Yang Diperoleh
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		25		
a. Kelengkapan dan Kesesuaian unsur isi artikel (10%)		2,50		2,50
b. Ruang lingkup dan kedalaman pembahasan (30%)		7,50		7,40
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)		7,50		7,40
d. Kelengkapan unsur dan kualitas penerbit (30%)		7,50		7,50
Nilai Total = (100%)		25,00		24,80
Nilai pengusul =			60% x 24,8	14,88

KOMENTAR/ULASAN PEER REVIEW

Kelengkapan dan Kesesuaian Unsur	: Artikel ini mencakup judul, abstrak, metode percobaan, hasil dan pembahasan, kesimpulan dan daftar putaka.
Ruang Lingkup dan Kedalaman Pembahasan	: Isi artikel masih dalam ruang lingkup jurnal Jurnal Kimia Sains dan Aplikasi yang meliputi melapisi serbuk TiO ₂ dengan polidimetilsiloksan (PDMS) untuk meningkatkan kemampuan pembersihan mandiri dan aktivitas antimikroba. Hasil percobaan dibahas dengan cukup jelas dan didukung dengan pustaka yang sangat memadai atau sekitar 65% dari pustaka yang digunakan.
Kecukupan & Kemutakhiran Data & Metodologi	: Jumlah dan kualitas data memadai untuk publikasi di jurnal nasional terakreditasi. Hampir semua pustaka yang digunakan bersifat mutakhir (95%) dan lebih dari 65 % digunakan dalam mendukung pembahasan.
Kelengkapan Unsur dan Kualitas Penerbit	: Jurnal ini tergolong dalam jurnal nasional terakreditasi SINTA Peringkat 2 tahun 2021. Editorial board berasal dari beberapa negara, terdapat pedoman penulisan yang jelas dan format penulisan konsisten. Pada umumnya, artikel yang disajikan merupakan hasil karya penulis dari berbagai universitas dan lembaga penelitian di Indonesia. Penerbit jurnal ini adalah Departemen Kimia - Universitas Diponegoro - Semarang. Gaya selingkung yang diterapkan jurnal ini cukup baik. Akan tetapi, dari 11 artikel yg terbit pada volume tsb, sebanyak 6 artikel ditulis oleh penulis dari Indonesia.

Semarang, 30 Oktober 2022

Penilai 1

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Bidang Ilmu : Teknik Kimia

Jabatan/Pangkat : Guru Besar

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		25		
a. Kelengkapan dan Kesesuaian unsur isi artikel (10%)		2,50		2,0
b. Ruang lingkup dan kedalaman pembahasan (30%)		7,50		7,0
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)		7,50		6,5
d. Kelengkapan unsur dan kualitas penerbit (30%)		7,50		6,5
Nilai Total = (100%)		25,00		22,0
Nilai pengusul =			60% x 22	13,2

KOMENTAR/ULASAN *PEER REVIEW*

Kelengkapan dan Kesesuaian Unsur	: Kelengkapan unsur artikel sudah memenuhi, unsur sudah lengkap dari abstract, introduction, material and methods, results and discussion, conclusion dan references. Tingkat plagiarisme sebesar 11%.
Ruang Lingkup dan Kedalaman Pembahasan	: Ruang lingkup penelitian sesuai dengan bidang penulis. Pembahasan yang dilakukan sudah mendalam, dari 37 referensi 68% digunakan dalam pembahasan.
Kecukupan & Kemutakhiran Data & Metodologi	: Penjelasan di materials and method sudah runtut. Referensi yang digunakan sudah mendukung dan sebagian besar berasal dari jurnal 10 tahun terakhir, hanya 3 jurnal dengan tahun lebih dari 10 tahun terakhir.
Kelengkapan Unsur dan Kualitas Penerbit	: Terbitan lengkap memuat volume, nomor, tahun dan daftar isi. Jurnal Kimia Sains dan Aplikasi termasuk jurnal nasional Sinta 2 dengan Nomor Keputusan No. 3/E/KP/2019

Semarang, 10 Okt 2022

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ISSN 2616-2907 e-ISSN 2502-4906



Jurnal Kimia Sains dan Aplikasi

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Volume 23 (Issue 1) January 2021 (Pages 1-28)

Chemistry Department
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Jurnal Kimia

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Journal of Scientific & Applied Chemistry

OPEN ACCESS

PEER REVIEW

ISSN: 1410-8917

e-ISSN: 2597-9914

Accredited by the Ministries of Research, Technology and Higher Education

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Last update: 20th February 2022

Number of documents: 552

Cites in Google Scholar: 1318

Google Scholar IF: 1318/552 = 2.39

h-Index: 14, i10-Index: 27

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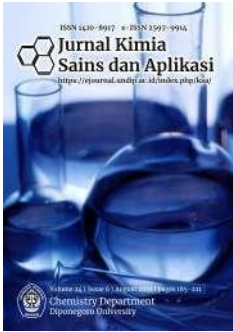
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Vol 24, No 6 (2021): Volume 24 Issue 6 Year 2021



Jurnal Kimia Sains dan Aplikasi
ISSN 1410-8917 and e-ISSN 2597-9914
Volume 24 Issue 6 Year 2021

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Citations 0
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| Language: EN (#) | DOI: 10.14710/jksa.24.6.185-191 (<https://doi.org/10.14710/jksa.24.6.185-191>)

Received: 16 Jun 2021; Revised: 3 Aug 2021; Accepted: 11 Aug 2021; Published: 31 Aug 2021.

TiO2-PDMS Super Hydrophilic Coating with Self-Cleaning and Antimicrobial Properties

(<https://ejournal.undip.ac.id/index.php/ksa/article/view/39276>)

Dessy Ariyanti, Afiatin Afiatin, Pury Diana Shintawati, Aprilina Purbasari

Citations 0
(<https://badge.dimensions.ai/details/doi/10.14710/jksa.24.6.192-199?domain=https://ejournal.undip.ac.id>)
| Language: EN (#) | DOI: 10.14710/jksa.24.6.192-199 (<https://doi.org/10.14710/jksa.24.6.192-199>)

Received: 18 Jun 2021; Revised: 28 Jul 2021; Accepted: 26 Aug 2021; Published: 31 Aug 2021.

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Kiky Corneliasari Sembiring, Anis Kristiani, Luthfiana Nurul Hidayati, Sudiarmanto Sudiarmanto, Fauzan Aulia, Asif Aunillah

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| Language: EN (#) | DOI: 10.14710/jksa.24.6.200-205 (<https://doi.org/10.14710/jksa.24.6.200-205>)

Received: 2 Jun 2021; Revised: 29 Jul 2021; Accepted: 26 Aug 2021; Published: 31 Aug 2021.

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Citations 0
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| Language: EN (#) | DOI: 10.14710/jksa.24.6.206-212 (<https://doi.org/10.14710/jksa.24.6.206-212>)

Received: 20 Apr 2021; Revised: 16 Jul 2021; Accepted: 25 Aug 2021; Published: 31 Aug 2021.

ISSN: 1410-8917
e-ISSN: 2597-9914

Accredited by the Ministries of Research, Technology and Higher Education
No: 3/E/KPT/2019

General information (#issueInfo)

Published: 31-08-2021
Total Articles: 5 (including Editorial)
Total Authors: 25

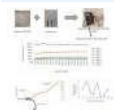
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(<https://badge.dimensions.ai/details/doi/10.14710/jksa.24.6.213-221?domain=https://ejournal.undip.ac.id>)

| Language: **EN (#)** | DOI: **10.14710/jksa.24.6.213-221**

(<https://doi.org/10.14710/jksa.24.6.213-221>)

Received: 30 Apr 2021; Revised: 23 Jun 2021; Accepted: 11 Aug 2021; Published: 31 Aug 2021.

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Visitor: 258787 [View My Stats](#)Jurnal Kimia Sains dan Aplikasi is indexed in:





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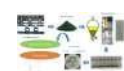
Jurnal Kimia Sains dan Aplikasi

ISSN 1410-8917 and e-ISSN 2597-9914
Volume 25 Issue 2 Year 2022
February 2022

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Language: EN (#) | DOI: [10.14710/jksa.25.2.41-48](https://doi.org/10.14710/jksa.25.2.41-48)

(<https://doi.org/10.14710/jksa.25.2.41-48>)

Received: 6 Aug 2021; Revised: 31 Jan 2022; Accepted: 5 Feb 2022; Available online: 26 Feb 2022; Published: 28 Feb 2022.



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Language: EN (#) | DOI: [10.14710/jksa.25.2.49-55](https://doi.org/10.14710/jksa.25.2.49-55)

(<https://doi.org/10.14710/jksa.25.2.49-55>)

Received: 7 Aug 2021; Revised: 18 Feb 2022; Accepted: 26 Feb 2022; Published: 28 Feb 2022.



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Language: EN (#) | DOI: [10.14710/jksa.25.2.56-62](https://doi.org/10.14710/jksa.25.2.56-62)

(<https://doi.org/10.14710/jksa.25.2.56-62>)

Received: 16 Nov 2021; Revised: 8 Feb 2022; Accepted: 16 Feb 2022; Published: 28 Feb 2022.



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Language: EN (#) | DOI: [10.14710/jksa.25.2.63-70](https://doi.org/10.14710/jksa.25.2.63-70)

(<https://doi.org/10.14710/jksa.25.2.63-70>)

Received: 19 Nov 2021; Revised: 20 Feb 2022; Accepted: 24 Feb 2022; Published: 28 Feb 2022.

General information (#issueInfo)

Published: 28-02-2022

Total Articles: 6
(including Editorial)

Total Authors: 24

Issues list

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| Language: **EN (#)** | DOI: **10.14710/jksa.24.5.146-151**

(<https://doi.org/10.14710/jksa.24.5.146-151>)

Received: 17 Mar 2021; Revised: 18 Jun 2021; Accepted: 26 Jun 2021; Available online: 31 Jul 2021; Published: 31 Jul 2021.



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| Language: **EN (#)** | DOI: **10.14710/jksa.24.5.152-160**

(<https://doi.org/10.14710/jksa.24.5.152-160>)

Received: 24 Apr 2021; Revised: 26 Jun 2021; Accepted: 28 Jun 2021; Published: 31 Jul 2021.



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| Language: **EN (#)** | DOI: **10.14710/jksa.24.5.161-169**

(<https://doi.org/10.14710/jksa.24.5.161-169>)

Received: 6 Jun 2021; Revised: 8 Jul 2021; Accepted: 13 Jul 2021; Published: 31 Jul 2021.



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| Language: **EN (#)** | DOI: **10.14710/jksa.24.5.170-176**

(<https://doi.org/10.14710/jksa.24.5.170-176>)

Received: 19 May 2020; Revised: 28 Jun 2021; Accepted: 26 Jul 2021; Published: 31 Jul 2021.

General information (#issueInfo)

Published: 31-07-2021

Total Articles: 5
(including Editorial)

Issues list

> **Vol 25, No 8 (2022): Volume 25 Issue 8 Year 2022**

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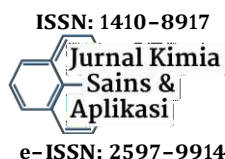
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TiO₂-PDMS Super Hydrophilic Coating with Self-Cleaning and Antimicrobial Properties

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<https://doi.org/10.14710/jksa.24.6.192-199>

Article Info	Abstract
Article history: Received: 18th June 2021 Revised: 28th July 2021 Accepted: 26th August 2021 Online: 31st August 2021 Keywords: antimicrobial; coating; self-cleaning; super hydrophilic; TiO₂-PDMS	In this paper, self-synthesized TiO₂ nanoparticle was used as a coating material with the addition of polydimethylsiloxane (PDMS) on the surface of the glass and ceramic substrate via spray coating. The self-cleaning properties of the coating with photocatalytic activity mechanism were observed under irradiation of black lamp as well as surface wettability. The antimicrobial properties and the morphology under a scanning electron microscope were also investigated. The results showed that the coating exhibited self-cleaning properties, as demonstrated by the photocatalytic degradation of methylene blue up to 80% and wettability as a super hydrophilic layer with a water contact angle less than 10° for both glass and ceramic substrate. The coating also shows an antimicrobial property by extending the radius of microbial growth up to 67% compared to the uncoated sample. 3% TiO₂ addition with 50% w/w PDMS is the optimum coating ratio for maximum photocatalytic activity, super hydrophilic, and antimicrobial properties.

1. Introduction

The use of cleaning chemicals for building maintenance, such as glass and tiles, was reported as more than 25% of the total cleaning product used for household consumption with a worth value of 76.8 million dollars for the Asia Pacific Region [1]. In addition to the expensive cleaning products, building maintenance is also subjected to extensive works and intensive labor as well as significant energy consumption [2]. Coating the building surfaces can be a sustainable method to minimize the use of cleaning chemicals that are not environmentally friendly and a way of reducing the building maintenance cost.

The coating is an additional layer applied to the surface of an object. The purpose of applying the coating may be decorative and functional. Coatings mostly have the objective of protecting the surface from damage or dirt and dust [3]. Another additional function of the coating is that the coating has either self-cleaning or antimicrobial properties. The self-cleaning coating is an additional layer on the surface of an object that in-built the ability to remove any debris or microorganism from

their surfaces in various mechanisms. This type of coating is expected to have hydrophilic or hydrophobic wettability properties. Hydrophilic is a mode of material that is attracted to water, while hydrophobic is the opposite. Many components can be used for self-cleaning coating, mainly metal oxides semiconductors such as Al₂O₃, TiO₂, SiO₂, SnO, ZnO, Si₃N₄, MgF₂ [4, 5, 6, 7]. Other research on self-cleaning coating used MnO₂ [8] and the addition of polydimethylsiloxane (PDMS) [9, 10].

TiO₂ nanoparticles have attracted much attention due to their potential application in various products such as catalysts for water treatment systems or renewable energy production, CO₂ reduction, and construction materials. TiO₂ is known for its low cost, good chemical, biological, and thermal stability, and high physical properties and photoactivity [11, 12]. A study revealed that self-cleaning coating using TiO₂ essentially utilizes solar energy to generate electrons and holes used to degrade organic compounds (dirt, dust, oil, and others) [9]. Meanwhile, low surface energy, low reactivity, low toxicity of



Facile Synthesis of ZnO Nanoparticles for the Photodegradation of Rhodamine-B

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<https://doi.org/10.14710/jksa.24.6.185-191>



Article Info	Abstract
Article history: Received: 16th June 2021 Revised: 3rd August 2021 Accepted: 11th August 2021 Online: 31st August 2021 Keywords: wastewater; dyes; sol-gel; photocatalyst; visible light	River pollution is a problem that is still very poorly handled. Industrial growth is the most significant contributor to produce this wastewater. The industry produces liquid waste such as dyes that do not meet handling standards because of the high cost. Photocatalyst is way better than other methods such as adsorption, coagulation, fluctuation, and others. However, there are still many shortcomings of the existing methods, such as high cost, high temperature, and dangerous by-products. This research seeks to provide a solution by synthesizing zinc oxide (ZnO) nanoparticles as a photocatalyst to reduce rhodamine B dye under visible light irradiation. ZnO nanoparticles were successfully synthesized through a simple sol-gel method in the form of a white powder by heating at a low temperature, 60°C. The XRD results show that the results have a diffraction peak that follows the standard ZnO with a hexagonal wurtzite crystal structure. According to the Scherrer equation, the crystal has a size of 22.61 nm. SEM analysis showed that the particle morphology and particle size were homogeneous with a spherical shape, ranging from 22–24 nm. Optimal ZnO photocatalytic activity at 90 minutes with an efficiency of 98.83%.

1. Introduction

The increasingly advanced era, making industry increasingly developing all over the world. The existence of industry in Indonesia brings one positive side and brings a negative side. One of the community's negative impacts that are felt most directly is the deterioration of environmental conditions caused by pollution in various aspects such as soil, water, and air pollution. Liquid waste in Indonesia is severe and has polluted the water. Rivers that are beginning to blacken with a strong odor in Indonesia indicate that the waters are polluted. This liquid waste comes from dyes from the textile industry, which uses organic compounds difficult to decompose and toxic. The presence of toxic organic substances and harmful dyes in wastewater creates a real threat to the environment. Therefore, any liquid waste needs to be

adequately treated [1, 2]. Rhodamine B, one of the textile industries wastes that pollute Indonesian waters, needs special handling because this compound is difficult to decompose and, when consumed by humans, can endanger human health. If it continues to be consumed in large doses and quite frequently, it can cause cancer. Studies about rhodamine B are still rare compared to other dyes, such as methylene blue. Therefore, this research was conducted to provide solutions to solve environmental problems caused by rhodamine B.

Various wastewater treatment and handling techniques have been developed to remove toxic contaminants from wastewater, such as adsorption [3], coagulation/flocculation [4], ozonation [5], biological treatment methods [6], photocatalysis [7], and others. One of the economical and effective ways to degrade



The Coated-Wire Ion-Selective Electrode (CWISE) of Tartrazine Using Chitosan as an Ionophore

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<https://doi.org/10.14710/jksa.24.6.206-212>



Article Info

Article history:

Received: 20th April 2021

Revised: 16th July 2021

Accepted: 25th August 2021

Online: 31st August 2021

Keywords:

ion-selective electrode (ISE); tartrazine; chitosan; Nernst value

Abstract

Research on the Ion-Selective Electrode (ISE) of coated wire-type tartrazine using chitosan as an ionophore has been developed. The variables used in the manufacture of ISE are membrane composition and immersion time. Meanwhile, the basic characteristics of ISE measured are Nernst value, measurement concentration range, detection limit, and measurement response time. The results showed that ISE tartrazine coated wire type had an optimum membrane composition in a mixture of chitosan: PVC: DOP of 3: 34: 63 (% w/w) and a membrane immersion time 20 minutes. The basic characteristics of ISE produce a Nernst value of 20.976 mV/decade. The measurement concentration range is 1×10^{-7} – 1×10^{-2} M with a detection limit of 2.749×10^{-7} M or 0.1469 ppm. The response time ranges from 10–60 seconds, with an average of 40 seconds.

1. Introduction

Food additives are generally used in processed food ingredients during the packaging, processing, and storage processes that are useful for improving appearance, taste, color, texture, preservation, and improving food quality [1]. The most used food additives are dyes, including natural and synthetic dyes. When compared with natural dyes, synthetic dyes over the last four decades have been widely used in the food industry because they have good solubility in water, high stability to oxygen, light and pH changes, low cost, high brightness, a wide color range, and little interference from microbes [2, 3, 4, 5].

Tartrazine is an azo synthetic dye that is bright yellow and is used in food products such as beverages, sweeteners, dairy products, bakery, and fast food products, ink industry, paints, cleaning products, detergents, paper and fabrics, pharmaceuticals, cosmetics [6, 7, 8]. In 2016 the Joint FAO/WHO Expert

Committee on Food Additives (JECFA) set the acceptable daily intake (ADI) for tartrazine at 0 to 10.0 mg/kg body weight. Excessive intake of tartrazine can cause allergies, asthma, migraine, eczema, anxiety, diarrhea, hyperactive behavior in children, acute oral toxicity, skin toxicity, chromosomal damage, and thyroid cancer [6, 9, 10]. Therefore, it is necessary to carry out a quantitative analysis of tartrazine in food products.

Several methods are used to determine tartrazine quantitatively, including high performance liquid chromatography [11], spectrophotometry [12, 13, 14], colorimetry [15], fluorescence [16], mass spectroscopy [17] and stop-flow analysis [18]. These methods have the advantage of being very sensitive and accurate. However, these methods require large amounts of reagents, take a longer time because they have to do sample preparation, require experts to operate the instrument because they use sophisticated equipment and are difficult to apply in the field. Therefore, a new simpler, cheaper, selective, sensitive, and fast method is needed.