

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

Judul Karya Ilmiah (Prosiding) : Synthesize of Cerium-doped ZnO nanoparticles as antioxidant agent
 Nama/ Jumlah Penulis : 4 Orang
 Status Pengusul : Penulis ke-4/ Penulis Korespondensi **
 Identitas Prosiding : a. Judul Prosiding : 6th International Conference on Advanced Materials for Better Future (6th ICAMBF 2021)
 b. ISBN/ISSN :
 c. Thn Terbit, Tempat Pelaks. : 28 Maret 2022, Surakarta
 d. Penerbit/Organiser : IOP Publishing Ltd
 e. Alamat Repository/Web : <https://iopscience.iop.org/issue/1742-6596/2190/1>
 Alamat Artikel : <https://iopscience.iop.org/article/10.1088/1742-6596/2190/1/012045/pdf>
 f. Terindeks di (jika ada) : Scopus

Kategori Publikasi Makalah : ☒ *Prosiding* Forum Ilmiah Internasional
 (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%)	2,50	2,80	2,65
b. Ruang lingkup dan kedalaman pembahasan (30%)	8,80	8,80	8,80
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	8,80	8,80	8,80
d. Kelengkapan unsur dan kualitas terbitan / prosiding (30%)	8,50	8,90	8,70
Total = (100%)			28,95
Nilai untuk Pengusul : $(40\% \times 28,95) = 11,58$			

Semarang, 15 Mei 2023

Reviewer 1



Prof. Dr. Agus Subagio, S.Si., M.Si.
 NIP. 19710813 1995121001
 Unit Kerja: FSM Universitas Diponegoro
 Bidang Ilmu: Fisika

Reviewer 2



Dr. Eng. Eko Hidayanto
 NIP. 197301031998021001
 Unit Kerja: FSM Universitas Diponegoro
 Bidang Ilmu: Fisika

**LEMBAR
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Kategori Publikasi Makalah : ☒ Prosiding Forum Ilmiah Internasional
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Hasil Penilaian Peer Review :

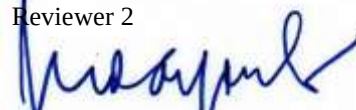
Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional ☒	Nasional ☐	
a. Kelengkapan unsur isi prosiding (10%)	3		2,8
b. Ruang lingkup dan kedalaman pembahasan (30%)	9		8,8
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9		8,8
d. Kelengkapan unsur dan kualitas terbitan /prosiding (30%)	9		8,9
Total = (100%)	30		29,3
Nilai Pengusul = (40% x 29,3) = 11,72			

Catatan Penilaian Paper oleh Reviewer :

- Kesesuaian dan kelengkapan unsur isi prosiding:**
Isi artikel sesuai dan memuat kelengkapan unsur-unsur isi prosiding yang terdiri dari abstrak, pendahuluan, metode, hasil dan pembahasan, kesimpulan serta daftar pustaka.
- Ruang lingkup dan kedalaman pembahasan:**
Artikel membahas sintesis nanopartikel cerium-doped zinc oxide yang berpotensi sebagai antioksidan. Nanopartikel cerium-doped zinc oxide disintesis menggunakan metode presipitasi yang dikombinasikan dengan radiasi ultrasonik. Metode sintesis yang digunakan memberikan alternative untuk mendapatkan nanopartikel pada temperature rendah. Hasil yang diperoleh pada artikel ini menunjukkan kedalaman dan ruang lingkup yang sangat baik. Hal itu tercermin dalam pemanfaatan nanopartikel cerium-doped zinc oxide sebagai antioksidan.
- Kecukupan dan kemutakhiran data/informasi dan metodologi:**
Data-data disajikan dalam grafik yang cukup baik dan merepresentasikan penggunaan metodologi penelitian yang baik serta memberikan informasi mutakhir mengenai aplikasi nanopartikel sebagai antioksidan.
- Kelengkapan unsur dan kualitas terbitan/ prosiding:**
Artikel diterbitkan dalam prosiding internasional terindeks scopus yang memenuhi kelengkapan unsur-unsur dan kualitas penerbitan baik.

Semarang, 16 Mei 2023

Reviewer 2



Dr. Eng. Eko Hidayanto, S.Si., M.Si.

NIP. 197301031998021001

Unit Kerja : Fisika

Bidang Ilmu: Fakultas Sains dan Matematika

**LEMBAR
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KARYA ILMIAH : PROSIDING**

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

Hasil Penilaian Peer Review :

Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional ☒	Nasional ☐	
a. Kelengkapan unsur isi prosiding (10%)	3		2,5
b. Ruang lingkup dan kedalaman pembahasan (30%)	9		8,8
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9		8,8
d. Kelengkapan unsur dan kualitas terbitan /prosiding (30%)	9		8,5
Total = (100%)	30		28,6
Nilai Pengusul = (40% x 28,6) = 11,4			

Catatan Penilaian Paper oleh Reviewer :

1. Kesesuaian dan kelengkapan unsur isi prosiding:

Tulisan sudah lengkap dan sesuai dengan template proceeding dengan semua unsur yang terdapat di dalamnya, seperti abstrak, pendahuluan, prosedur eksperimen, hasil dan pembahasan, kesimpulan, dan daftar pustaka.

2. Ruang lingkup dan kedalaman pembahasan:

Artikel telah membahas sintesis nanopartikel cerium-doped zinc oxide yang berpotensi sebagai antioksidan. Metode sintesis yang digunakan memberikan alternative untuk mendapatkan nanopartikel pada temperature rendah telah dibahas secara mendalam. Paper ini juga dilengkapi dengan referensi pada bagian pembahasan untuk menguatkan diskusi.

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

Metode disajikan secara detail dan data yang diberikan diinterpretasikan dalam bentuk grafik, gambar dan diagram sehingga memberikan hasil yang sangat baik. Referensi yang digunakan juga cukup baik.

4. Kelengkapan unsur dan kualitas terbitan/ prosiding:

Artikel diterbitkan dalam prosiding internasional terindeks scopus yang memenuhi kelengkapan unsur-unsur dan kualitas penerbitan baik.

Semarang, 16 Mei 2023

Reviewer 1



Prof. Dr. Agus Subagio, S.Si., M.Si.

NIP. 19710813 1995121001

Unit Kerja : Fisika

Bidang Ilmu: Fakultas Sains dan Matematika



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Synthesize of Cerium-doped ZnO nanoparticles as antioxidant agent

Asma F.; Prasetyo W.; Priyono; [Nurhasanah I.](#)

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^a Department of Physics, Faculty of Science and Mathematics, Universitas Diponegoro, Jl. Prof. Sudarto, S.H. Semarang, 50275, Indonesia

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Ceria-based materials for hydrogen production by thermochemical splitting of H₂O

Sanz, R. , Marugán, J. , Botas, J.A. (2016) *WHEC 2016 - 21st World Hydrogen Energy Conference 2016, Proceedings*

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Abstract

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Abstract

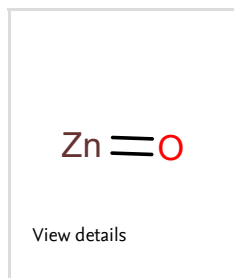
Zinc oxide nanoparticles are potential metal oxide for antioxidant agent. This paper investigates antioxidant activity of cerium-doped zinc oxide (Ce-doped ZnO) nanoparticles. Ce-doped ZnO nanoparticles was prepared by precipitation method with calcination temperature of 200°C. The product of precipitate was characterized by X-ray diffraction measurement, and UV-Vis spectrophotometer. The antioxidant activity of Ce-doped ZnO nanoparticles was investigated using 1,1-

diphenyl-2-picrylhydrazyl (DPPH) method. The X-ray diffraction pattern showed the growth of Ce-doped ZnO crystalline structure of hexagonal wurtzite with crystallite size of 42 nm. UV-Vis absorbance spectrum analysis revealed the band gap energy of Ce-doped ZnO nanoparticles was smaller than band gap energy of bulk ZnO. Ce-doped ZnO nanoparticles could scavenge DPPH free radicals and exhibited moderate antioxidant activity. © 2022 Published under licence by IOP Publishing Ltd.

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potential of ZnO nanorods

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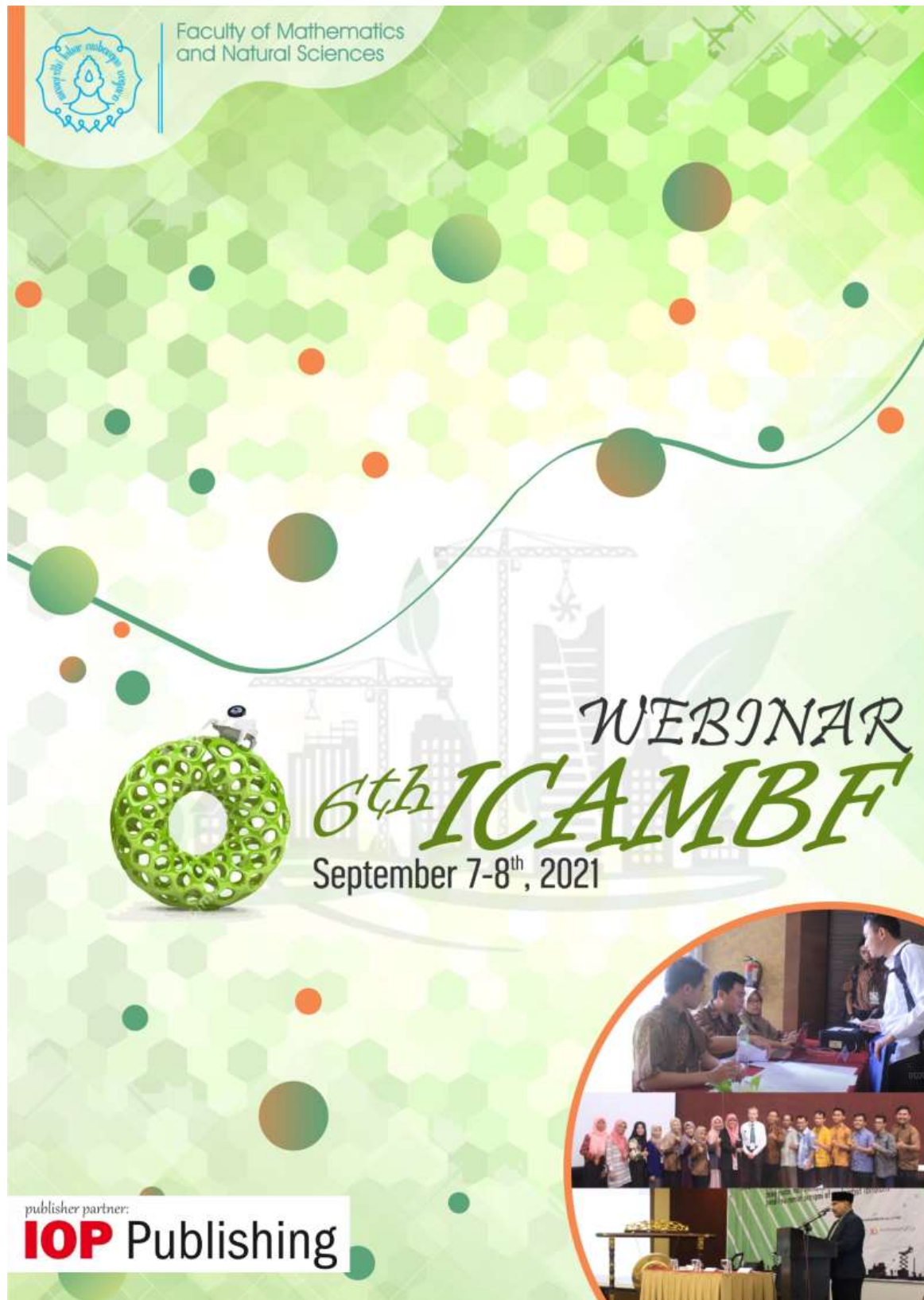
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Preface

The international conference on Advanced Materials for Better Future (ICAMBF) 2021 was held on September 7-8, 2021 in Surakarta, Central Java, Indonesia. Due to New Normal condition of the Covid-19 Pandemic, ICAMBF 2021 was held through a Webinar (Virtual Conference). This conference is a scientific forum covers all frontier topic in advancement of smart material materials for the applications of human being. The importance of this conference is to communicate the knowledge, best practices and solutions among different countries when facing technological or non-technological problems. In particular, financial and political support to initiatives related to the advancement of science and technology for sustainable development and also especially the technology needed to overcome covid pandemic problem.

From this opportunity I would like to convey a message to all scientists and participants coming to this conference: since the natural resources on the earth are limited, we have to develop science and technology environmental soundly for sustainable development goals. We have to use them wisely, think our world and save our world for future generation.

I would like to extend a very warm welcome to distinguished keynote speaker: Prof. Santiago Gomez Ruiz, Rey Juan Carlos University, Móstoles (Madrid), Spain, Prof. Roger Narayan from University of North Carolina USA, Prof. Suresh Valiyaveetil from National University of Singapore, Singapore, Prof. Takahiko Miyazaki from Kyushu University, Japan, Prof. MD., Rahim bin Sahar from Universiti Teknologi Malaya, Malaysia, Dr. Muthuraaman from University of Madras Guindy, India, Budi Sampurno from PT. Dirgantara Indonesia (Indronesia Aircraft Company), Prof. Venty Suryanti and Prof. Ari Handono Ramelan (UNS) and also I would like to thank to all participants that I could not mention all. The theme this year conference is challenges and opportunities of smart materials for achieving sustainable developments goals.

Special thanks were addressed to the conference committees: Prof. Ari Handono Ramelan, Prof. Dr. Sayekti Wahyuningsih, Dr. Ahmad Marzuki, Prof. Venty Suryati, Dr. Desi Suci Handayani, Prof. Fitria Rahmawati, Dr. Eng. Risa Suryana, Dr. Tetri Widiyani, Dr. Edi Pramono, Dr. Ahmad Ainurrofiq, Dr. Ahmad Ainurrofiq, Dr. rer. nat Fajar Rakhman Wibowo, Dr. Teguh Endah Saraswati, Rita Rakhmawati, Prof. Santiago Gomez Ruiz, Prof. Roger Narayan, Prof. Suresh Valiyaveetil, Prof. Takahiko Miyazaki, Prof. Dr., MD., Rahim Bin Sahar, Dr. B. Muthuraaman and Budi Sampurno. We would like to extend our gratitude to all reviewers and editors: Rosid Eka Mustofa, Windy Ayu Lestari and Yohan Aldi Ismoyo for their hard work.

The participants to this conference is 82 participants coming universities (such as UNS, UI, UNDIP, Universitas Muhammadiyah Jakarta, Universitas Wahid Hasyim, UIN Walisongo Semarang), research institution (BATAN, LITBANG, dan LIPI), goverment and overseas participants from Hungary, Rwanda Africa, Suriname, and Papua New Guine. The objective of the conference : (a) As a scientific forum covers all frontier topic in advanced materials and nanotechnology, related scientists, researchers and research scholars to communicate their research outcomes, sharing ideas and knowledge about all aspects of advanced materials and nanotechnology, (b) Provides the premier interdisciplinary and multidisciplinary forum for researchers, practitioners and educators to present and discuss

the most recent innovations, trends, and concerns, practical challenges encountered and the solutions adopted in advanced materials and nanotechnology.

Finally, to the participants of this conference I hope that you will have a pleasant and rewarding stay in Surakarta Solo City. Your deliberations during this coming will have an important role in improving the quality of the scientific and technology for our future.

Wassalamualaikum warahmatullahi wabarakatuh

Prof. Ir. Ari Handono Ramelan, MSc.(Hons), PhD.
Chairman of ICAMBF 2021

Peer Review statement

All papers published in this volume of “**IOP Proceedings: Journal of Physics conference series**” have been peer reviewed through processes administered by the proceedings Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a proceedings journal published by IOP Publishing.

Chairman	Prof. Ir. Ari Handono Ramelan, M.Sc., (Hons), Ph.D.	Sebelas Maret University, Indonesia
Co-Chairman	Prof. Dr. Sayekti Wahyuningsih, MSi	Sebelas Maret University, Indonesia
Secretary	Ahmad Marzuki, SSi, PhD	Sebelas Maret University, Indonesia
Scientific Committee	Prof. Venty Suryanti. M.Phil. PhD	Sebelas Maret University, Indonesia
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	Teguh Endah Saraswati, M.Sc, Ph.D	Sebelas Maret University, Indonesia
	Dr. rer. nat. Fajar Rakhman Wibowo, S.Si, M.Si	Sebelas Maret University, Indonesia
	Prof. Santiago Gomez Ruiz	Rey Juan Carlos University, Mostoles (Madrid), Spain
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	Budi Sampurno	PTDI
	Prof. Dr., MD., Rahim Bin Sahar	Universiti Teknologi Malaya, Malaysia
Editor	Ahmad Marzuki, SSi, PhD	Sebelas Maret University, Indonesia
	Rosid Eka Mustofa, S.Si	Sebelas Maret University, Indonesia

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2022

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6th International Conference on Advanced Materials for Better Future (6th ICAMBF 2021)
07/09/2021 - 08/09/2021 Online

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Preface

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MCP (Material chemistry and physics)

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The effect of extraction time on the quality of brown seaweed Na-Alginate *Sargassum polycisteum* as the base material for SBK Edible Film

R N Latifah, S Rahmania and B L Rohmah

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Modification of coal fly ash waste by using core-shell method for Cu²⁺ adsorbent material

S Saputro, L Mahardiani, M Masykuri, S Yamtinah and Cinthia

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012041

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U Riyadi, A I Devi, D Marentina and F Nurosyid

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012042

The effect of mixing Chlorophyll-Antocyanin as a natural source dye on the efficiency of dye-sensitized solar cell (DSSC)

M R Munandar, A S R Hakim, H A Puspitadinda, S P Andiyani and F Nurosyid

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PDF

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012043

The effect of configuration structure of lithium-ion battery: analysis of the temperature distribution performance

E T Nugraheni, A Supriyanto and A H Ramelan

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012044

Thin layer of nano composite RGO COMOS as a counter electrode on Dye Sensitized Solar Cell (DSSC)

K R Kawuri, A H Ramelan, A Supriyanto, S Wahyuningsih, Harjana and H I Fathoni

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AN (Advanced Nanomaterials)**OPEN ACCESS**

012045

Synthesize of Cerium-doped ZnO nanoparticles as antioxidant agent

F Asma, W Prasetyo, Priyono and I Nurhasanah

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PDF

MT (Miscellaneous topics of advanced materials)**OPEN ACCESS**

012046

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The effect of extraction time on the quality of brown seaweed Na-Alginate *Sargassum polycistum* as the base material for SBK Edible Film

R N Latifah¹, S Rahmania¹, B L Rohmah¹

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Abstract. Brown seaweed is an alginate-producing seaweed because of its high polysaccharide hydrocolloid content. Alginate is one type of hydrocolloid by organic polymers in water. This study aimed to obtain a suitable method in producing sodium alginate to produce a large yield. The research method includes the preparation of seaweed, extraction, and purification of alginate using EDTA, and testing the quality of the resulting alginate. The results showed that the yield of alginate produced in this study was 18.47-24.31%. The viscosity and water content test results showed that the alginate yield was 892 cps with an extraction time of 6 hours and 14.82% (w/v). Functional group analysis revealed a mannuronate fingerprint region that indicated the absorption peak from alginate characteristics. The ash content test produced is in the range of 14.25%-26.57%. The pH of Na-alginate is in the range between 8-10. Water vapor transmission rate is ranged from 10.13-11.56 g/m².hours to edible film application.

1. Introduction

Indonesia is one of the countries with the longest and widest coastal area in the world and a country with abundant natural resources. One of Indonesia's leading commodities is seaweed [1]. The wealth of seaweed in Indonesia is about 769,452 ha. Commonly, there are three types of seaweed those are red, green, and brown seaweed. It grows and spreads hardly all water areas in Indonesia. However, one type of seaweed that is abundant and has not been used widely is brown seaweed [2]. Brown seaweed is an alginate-producing seaweed because of its high polysaccharide hydrocolloid content. Potential alginate sources can be found in brown macroalgae such as *Durvillaea*, *Laminaria*, *Sargassum*, and *Turbinaria* [3]. This type of brown seaweed that is still rarely used is the *Laminaria* type. *Laminaria* is a type of seaweed that produces high-yield alginate [4].

Alginate is one of the hydrocolloid types by organic polymers in water [3]. Alginates are compounds in salt form or derivatives of alginate acid. It is formed by two polymers that is D-mannuronic acid and L-Guluronic acid [5]. Alginate is phycocolloid from brown seaweed [6]. In Industry, alginate is known in the form of alginate acid or alginate salt. Alginate is widely used in the textile, food, paper, and pharmaceutical industries [7]. For example, alginate is used in the food industry as an emulsifier, suspension, and viscosity regulator [8]. In the textile printing industry, alginate is used as a uniformity regulator, penetration controller, and viscosity regulator [9].

Many benefits of alginate in food and non-food industries are the background of this research to find a suitable method to produce alginate from *Sargassum polycistum* with high yield [10]. Besides, it is supported by the condition of Indonesia territory, which is rich with abundant seaweed. One



Drug loading ability and release study of various size small mesoporous silica nanoparticle as drug carrier

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Abstract. Mesoporous silica nanoparticles (MSN) have been widely developed as drug carriers for various drug models in various particle sizes. The morphology of MSN becomes one of the factors which influence drug loading ability. In this study, we investigated the correlation between particle size and surface charge toward the loading ability of MSN. We used various morphology of MSN included its zeta potential value and quercetin as a drug model. The result showed that both particle size and zeta potential value have a correlation toward loading ability. The smaller particle size has a higher loading ability. Meanwhile, the more negative surface charge has a higher loading ability. Additionally, we studied the drug release profile of MSN with different particle sizes. It showed that particle size and zeta potential value play important role in the drug release process to produce a typically-release profile.

1. Introduction

The number of cancer patient increases every year and estimated at 1.8 million cases in 2020 that become a great concern worldwide to solve [1,2]. Chemotherapy still became a common cancer therapy widely used [3]. Therefore, it has negative side effect that harmful for patient health such as killed not only cancer cells but also the healthy cells [4]. Some innovation had come out to reduce the effect of chemotherapy such as through drug delivery system [5]. One of the potential candidates that widely develop is mesoporous silica nanoparticle due to their adjustable morphology, non-toxic, and good biocompatibility [6–9]. Small particle size of MSN became the promising material for drug carrier in clinical application due to ease to taken by cell [10–12].

Some drugs have been successfully loaded into MSN such as doxorubicin, methotrexate, mitoxantrone, quercetin, curcumin, and metallodrug [13–22]. The drug loading process is influenced by MSN morphology, such as particle size and surface area [23,24]. In this study, we have investigated the influence of particle size of MSN, which affect surface area as well, toward drug loading ability used quercetin as the drug model. In addition, we statistically calculate the correlation between these variables by Pearson correlation method.

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