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

Judul Karya Ilmiah (Prosiding)	:	Influence of the calcination temperature on the formation of precipitated ZnO:Ce nanocrystal by employing ultrasound irradiation		
Nama/ Jumlah Penulis	:	2 Orang		
Status Pengusul	:	Penulis kedua/ Penulis Korespondesi **		
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		c. Thn Terbit, Tempat Pelaks.	:	Juli 2021, Semarang
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	Reviewer I	Reviewer II	
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b. Ruang lingkup dan kedalaman pembahasan (30%)	8,0	8,7	8,35
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	8,5	8,7	8,60
d. Kelengkapan unsur dan kualitas terbiatan / prosiding (30%)	8,0	8,7	8,35
Total = (100%)			27,90
Nilai untuk Pengusul : (50% x 27,90) = 13,95			

Semarang, 15 Mei 2023

Reviewer 1

Prof. Dr. Agus Subagio, S.Si., M.Si.
NIP. 19710813 1995121001
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Bidang Ilmu: Fisika

Reviewer 2

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

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
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Nama/ Jumlah Penulis	:	2 Orang		
Status Pengusul	:	Penulis kedua/ Penulis Korespondesi **		
Identitas Prosiding	:	a. Judul Prosiding	:	10th International Seminar on New Paradigm and Innovation of Natural Sciences and its Application
		b. ISBN/ISSN	:	1757-8981
		c. Thn Terbit, Tempat Pelaks.	:	Juli 2021, Semarang
		d. Penerbit/Organiser	:	IOP Publishing Ltd
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		f. Terindeks di (jika ada)	:	Scopus

Kategori Publikasi Makalah (beri ✓pada kategori yang tepat) : [√] *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		2,5
b. Ruang lingkup dan kedalaman pembahasan (30%)	9		8,0
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9		8,5
d. Kelengkapan unsur dan kualitas terbitan /prosiding (30%)	9		8,0
Total = (100%)	**30**		**27**
Nilai Pengusul = (50% x 27) = 13,5			

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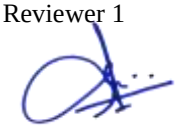
1. **<u>Kesesuaian dan kelengkapan unsur isi prosiding:</u>**
   Tulisan sudah lengkap dan sesuai dengan template proceeding dengan semua unsur yang terdapat di dalamnya, seperti abstrak, pendahuluan, prosedur eksperimen, hasil dan pembahasan, kesimpulan, dan daftar pustaka.
2. **<u>Ruang lingkup dan kedalaman pembahasan:</u>**
   Artikel ini membahas mengenai sintesis nanokristal seng oksida doping cerium (ZnO:Ce) menggunakan metode presipitasi untuk menginvestigasi pengaruh suhu kalsinasi terhadap pembentukan dan sifat optik nanokristal ZnO:Ce. Artikel ini juga dilengkapi dengan referensi pada bagian pembahasan untuk menguatkan diskusi.
3. **<u>Kecukupan dan kemutakhiran data/informasi dan metodologi:</u>**
   Metode yang digunakan standar dengan menggunakan metode sintesis presipitasi yang dikombinasikan dengan radiasi ultrasonik. Uji karakterisasi yang digunakan dapat menjelaskan dengan baik bagaimana pengaruh dar suhu kalsinasi terhadap pembentukan nanokristal ZnO:Ce. Referensi yang digunakan cukup baik.
4. **<u>Kelengkapan unsur dan kualitas terbitan/ prosiding:</u>**
   Artikel ini dipublikasikan di prosiding internasional terindeks scopus sehingga memiliki unsur-unsur yang lengkap dan kualitas yang sangat baik.

Semarang, 15 Mei 2023
Reviewer 1



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NIP. 19710813 1995121001
Unit Kerja : Fisika
Bidang Ilmu: Fakultas Sains dan Matematika

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Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional [√]	Nasional [ ]	
a. Kelengkapan unsur isi prosiding (10%)	3		2,7
b. Ruang lingkup dan kedalaman pembahasan (30%)	9		8,7
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9		8,7
d. Kelengkapan unsur dan kualitas terbitan /prosiding (30%)	9		8,7
Total = (100%)	**30**		**28,8**
Nilai Pengusul = (50% x 28,8) = 14,4			

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2. **Ruang lingkup dan kedalaman pembahasan:**
   Dalam artikel ini dibahas mengenai sintesis nanokristal seng oksida yang didoping cerium (ZnO:Ce) menggunakan metode presipitasi. Ruang lingkup penelitian ini adalah menginvestigasi pengaruh suhu kalsinasi terhadap pembentukan dan sifat optik nanokristal ZnO:Ce. Nanokristal ZnO:Ce dikarakterisasi menggunakan diffraktometer sinar-X dan spektrofotometer UV-Vis. Hasil penelitian menunjukkan bahwa suhu kalsinasi sangat mempengaruhi pembentukan nanokristal ZnO:Ce dengan pembahasan yang baik mengenai modifikasi sifat optik dan struktur dalam variasi suhu kalsinasi yang dilakukan.
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**
   Data-data yang diperoleh sangat mendukung tujuan dari penelitian menggunakan metode yang sangat baik yaitu metode sintesis presipitasi yang dikombinasikan dengan radiasi ultrasonik. Karakterisasi yang digunakan dapat menjelaskan dengan baik bagaimana pengaruh dar suhu kalsinasi terhadap pembentukan nanokristal ZnO:Ce.
4. **Kelengkapan unsur dan kualitas terbitan/ prosiding:**
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Semarang, 15 Mei 2023
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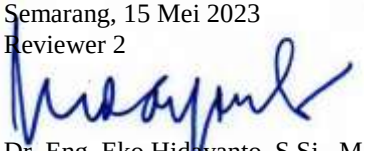

Dr. Eng. Eko Hidayanto, S.Si., M.Si.
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Bidang Ilmu: Fakultas Sains dan Matematika

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This certificate is presented to

Siti Rohmaniah

for outstanding contribution as

Presenter

at the Virtual Conference of the 10th International Seminar on New Paradigm and Innovation of Natural Sciences and its Application (ISNPINSA), held on September 24th-25th, 2020
with paper entitled as follows:

Influence of The Calcination Temperature on the Growth of precipitated ZnO:Ce Nanocrystal by Employing Ultrasound

Semarang, September 25th, 2020

Dean of Faculty of Science and Mathematics
Diponegoro University

Prof. Dr. Widowati, S.Si., M.Si.
NIP. 196902141994032002

Chair of
The 10th ISNPINSA

Nor Basid Adiwibawa Prasetya, S.Si., M.Sc., Ph.D.
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Influence of the calcination temperature on the formation of precipitated ZnO:Ce nanocrystal by employing ultrasound irradiation

Rohmaniah S.; Nurhasanah I.

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[a] Department of Physics, Faculty of Science and Mathematics, Universitas Diponegoro, Indonesia

Abstract

Cerium doped Zinc Oxide (ZnO:Ce) nanocrystals were synthesized through precipitation of nitrate solution by employing ultrasound irradiation. The precipitate products were calcinated at various temperature. The calcination temperature is an important key on the formation and properties of nanocrystal. This paper studied influence of calcination temperature on the formation and optical properties of ZnO:Ce nanocrystal. ZnO:Ce nanocrystals were characterized by x-ray diffractometer and

UV-Vis spectrophotometer. The x-ray diffraction patterns revealed the formation of hexagonal wurtzite crystal structure for ZnO:Ce nanocrystals. The increase in calcination temperature improved crystallinity and reduced the band gap energy of ZnO:Ce. The result showed that the calcination temperature strongly influenced ZnO:Ce nanocrystals formation. The optical properties of ZnO:Ce nanocrystal can be modified by varying calcination temperature. © Published under licence by IOP Publishing Ltd.

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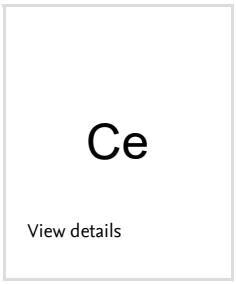

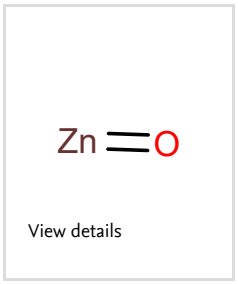

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Preface

The 10th International Seminar on New Paradigm and Innovation on Natural Science and Its Application (10th ISNPINSA)

"Developing Innovations and Challenges in Science And Technology For Better Living"

September 24-25, 2020

PREFACE

The International Seminar on New Paradigm and Innovation of Natural Sciences and its Application (ISNPINSA) is an annual conference organized by the Faculty of Sciences and Mathematics (FSM), Diponegoro University (UNDIP), Semarang, Central Java, Indonesia. This seminar has been successfully conducted since 2011 and therefore becoming an annual event since then. This annual ISNPINSA has been intensively achieved high level improvement in strengthening the collaboration between scientists either from Indonesia or other countries, stimulating a new research partnership, and contributing to formulating policies to increase the important roles of science for the community.

The 10th ISNPINSA was held on September 24-25, 2020 with the theme of "DEVELOPING INNOVATIONS AND CHALLENGES IN SCIENCE AND TECHNOLOGY FOR BETTER LIVING". Due to the outbreak of COVID-19, the conference process was carried out virtually using licensed Zoom media. The presentations were categorized into two terms, which were plenary presentation and parallel presentation. Keynote speakers were invited to deliver their expertise and research findings at the plenary presentation and each had given 1 hour of speech. While invited speakers together with all parallel presenters delivered their presentation in parallel session with time of speech including Q&A for each of 15 minutes.

The number of participants of the seminar were 313 including 7 keynote speakers, 5 invited speakers, presenters and non-presenters coming from various institutions of various countries consist of researchers, lecturers, postgraduate and undergraduate students from various universities. There were 263 papers presented in this seminar and after the review process, there are 199 articles to be published in the present conference proceeding. All published articles remain the sole responsibility of the author for the content of the paper.

We would like to take this opportunity to extend our appreciation to all keynote speakers and invited speakers for their valuable presentation. We also would like to thank all the authors for submitting and presenting their papers to our conference, the Organizing Committee members and the supporting staff for their hard work, as well as all the Scientific& Editorial Committee and the reviewers for their constructive recommendations and critical comments helped to improve of the submitted papers. All these contributions eventually make the 10th ISNPINSA 2020 a successful and fruitful event.

The 10th ISNPINSA 2020 Organizing Committee hopes you will enjoy reading this JPCS volume.

The Chairman,
Nor Basid Adiwibawa Prasetya, S.Si., M.Sc., Ph.D

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4. Prof. Ming- Chien Su, Ph.D, *National Dong Hwa University, Taiwan*
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7. Prof. Dr. Khairil Anwar Notodiputro, *Institut Pertanian Bogor University, Indonesia*

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Physicochemical characterization of kappa-iota carrageenan gel with papain enzyme

D Fransiska[1], B S B Utomo[1], M Darmawan[1], D Gozali[2], M N Iqbal[2]

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Abstract. Carrageenan is a group of galactose polysaccharides extracted from seaweed and has the ability to form a thermo-reversible gel or a viscous solution when added to the salt solution widely utilized as gelling, thickener and stabilizers in various industries such as food, pharmaceuticals, cosmetics , printing, and textiles. Only two types of carrageenan can be used in the manufacture of hydrogels which are kappa and iota. Kappa-carrageenan is produced from the tropical seaweed *Kappaphycus alvarezii* and *Eucheuma denticulatum* is the main species producing iota-carrageenan. The aim of this research is to know the composition of kappa-carrageenan and iota-carrageenan mixture as gel base to produce the optimum physical properties and to know the physical properties of optimum formula with the addition of papain enzyme for 4 weeks storage. The determination of the optimum formula of mixed carrageenan kappa and iota gel with Simplex Lattice Design method. The physical properties of the optimum formula with the addition of papain enzyme during 4 weeks storage are viscosity, pH, dispersion, and sineresis of optimum formula were statistically verified using Anova Univariate method of experimental design of two factorial with 95% confidence level. The results showed that the optimal formula of mixed carrageenan kappa and iota respectively concentrations of 0.3%, 1% and the use of 0.8% papain enzyme.

1. Introduction

Indonesia is one of the largest *Eucheuma* seaweed producing countries in the world. Based on statistical data from the *Food and Agriculture Organization* in 2014, Indonesia produces *Eucheuma* seaweed amounting to 81.4% of the total production of *Eucheuma* seaweed in the world. However, 64% of the total seaweed production in Indonesia is only exported and little use is made of the processed seaweed product.

Carrageenan is a group of galactose polysaccharides extracted from seaweed. Most of the carrageenan contains sodium, magnesium, and calcium which can be bound to the sulfate ester groups of galactose and copolymer 3,6-anhydrogalactose. Complex carrageenan is water soluble, linear chain and galactant sulfate. This compound consists of a number of galactose and 3,6-anhydrogalactose units that are bonded with sulfate groups or with α 1,3-D-galactose and ß 1,4-3,6-anhydrogalactose bonds. Based on the sulfate substituent in each monomer, carrageenan can be divided into several types, namely kappa, iota, lamda, mu, nu and x-carrageenan (1). However, only two types of carrageenan that can be used in the manufacture of hydrogels, namely kappa and iota (2).

Naturally, iota and kappa types are formed enzymatically from their precursors by sulfohydrolase. While commercially, this type is produced using alkaline treatment or extraction with

Development of scattered radiation distribution visualization system using WebAR

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Abstract. Radiation protection education is difficult for some radiological workers to taking because they are busy with medical work. In radiation protection, understanding the behaviour of scattered radiation is important for reducing exposure. Although applications that visualize the behaviour of scattered radiation using augmented reality or virtual reality have been developed, such applications are limited by the need to download the application and the performance of the device. We have developed a system that can be used in a web browser to visualize the behaviour of scattered radiation more easily. Monte Carlo method was used to simulate the behaviour of scattered radiation during radiography using a portable X-ray machine. An augmented reality (AR) system was developed using A-Frame, an open-source web framework, and AR.js, which adds the AR function. Finally, the behaviour of scattered radiation was observed using various devices. With AR, the behaviour of scattered radiation was visualized in three dimensions. The newly developed AR system can be used with web browsers to easily learn the behaviour of scattered rays without the need for special devices.

1. Introduction

Radiological workers may have little opportunity to receive proper education on radiation protection because of their busy work schedules [1] [2]. Good knowledge of radiation protection is necessary for these workers to be able to perform their duties safely, and thus methods that help workers acquire this knowledge quickly and easily are being developed. In radiation protection, one of the important factors to understand is the behaviour of scattered radiation, which helps in reducing one's exposure to radiation [2]. However, visualization of the behaviour of scattered radiation is difficult because scattered radiation is invisible.

In the past, the spread of scattered rays was displayed in two-dimensional (2D) isolines and colour images [3]. However, the behaviour of scattered radiation is 3D, and understanding how scattered radiation actually spreads in an examination room can be difficult if only the conventional 2D methods are used. Research using technologies such as virtual reality (VR) and augmented reality (AR) has thus made it possible to observe the spread of radiation in 3D and to visualize the behaviour of scattered radiation. In a study by Matthias et al., VR was used to visualize the behaviour of scattered radiation during intraoperative imaging and fluoroscopy using a C-arm [4]. The study demonstrated how VR allowed the operator to confirm the captured image and observe the behaviour of scattered radiation

Solanum lycopersicum and *Daucus carota*: effective anticancer agents (a mini review)

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Abstract. The high cost, scarce availability, and some extraneous side effects of some pharmaceuticals have diverted the majority's mindset towards the use of nutraceuticals as both prophylactic and therapeutic alternatives. The cancer incidence in the low and middle-income countries has risen due to several factors, but notably, it has been due to poverty and the non-availability of screening centers. The non-toxic nature, high availability, and low cost of food-based nutraceuticals have been a significant advantage to its users. Solanum lycopersicum is well-known to possess excellent antioxidant, anti-inflammatory, and anticancer potential, and this has been attributed to its potent bioactive compound, lycopene. The presence of β-carotene in Daucus Carota has also contributed immensely to its antioxidant and anticancer properties. Nutraceuticals are considered suitable for anticancer drug development due to their pleiotropic actions on target sites with multiple effects. This short review has explored the dietary characteristics, bioactive components and mild anticancer effects of tomatoes and carrots.

1. Tomatoes (Solanum lycopersicum)

Tomatoes (*Solanum lycopersicum*) has sailed high to become one of the world's most recognized vegetables. It has long been in global recognition as one of the most essential vegetable with high antioxidant activity. This juicy vegetable originated from the western South America, with a wide range of different diversities of wild tomatoes recorded in Peru [1]. Tomatoes were placed in the genus Solanum as Solanum lycopersicum by Carolus Linnaeus in 1753. Two years later, but this was modified by another researcher Philip Miller (1754), who felt the need to integrate the other species of tomatoes in the genus hence he came up with a new genus, Lycopersicon [2]. Lycopersicon esculentum Mill was coined to accommodate tomatoes and its several species. The different species of Solanum are found to be present on all temperate and several tropical continents, which is attributed to their morphological and ecological diversity. Tomato is known to be the third most vital and highly nutritious vegetable cultivated in the world, and also, it battles with banana for the most consumed fruit in the world [3]. It is an edible red fruit berry with a well-seeded ovary. The fruit colour varies from green to yellow, which further projects into yellow to orange then to red based on the maturity stage. In most cases, the quality of carotenoids embedded in the fruit determines the colour of tomatoes. Carotenoids such as lycopene, chlorophylls, and β-carotene are liable for the colour of the fruit [4]. The red and orange colours of tomatoes are attributed to the quantity of the lycopene and β-carotene, respectively. The fruit's green

Spintronic terahertz emission from Ni/Pt bilayer grown on MgO

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Abstract. Spintronic THz emission from Ni/Pt bilayer grown on MgO is reported based on the novel THz emitter using metallic structures. The Ni metal was deposited first on a MgO substrate and capped with a thin Pt metal via electron beam deposition. The THz emission data was obtained using a standard terahertz time-domain spectroscopy setup using a Ti: sapphire laser excitation source. Initial measurements were done using 800nm excitation with 7 mW and 185 mW pump powers under upward and downward magnetic field orientations. Polarity reversal of the terahertz signal was observed upon changing the orientation of the magnetic field. Maximum amplitude was found at 0.5 THz with bandwidth up to ~6 THz. A saturation fluence of 85.04 mJ/cm^2 was calculated from the pump fluence-dependence plot of the THz peak-to-peak signal. The results are consistent with the spintronic THz emission due to the inverse spin-Hall effect and provide insights for future development and optimizations.

1. Introduction

Terahertz (THz) radiation, or electromagnetic radiation in general, has been known to be generated when charge carriers accelerate [1]. This has been utilized in THz emission of materials, especially in semiconductors which main mechanisms are by drift-related current and/or diffusion-related current [2,3]. To optimize these mechanisms, different methods have been employed, such as varying dopant concentrations [2], low-temperature growths [4], epitaxial layer designs [5], and quantum structures [6]. Fabrication techniques have also been implemented like the photoconductive antenna (PCA) designs which accelerate excited electrons from one electrode to another in the presence of an electrical bias [7].

Recently, a different THz mechanism was reported by Kampfrath et al., which involves the spin property of the electrons [9]. This opens up spintronics, or spin electronics, in the THz research or possibly vice-versa. The designed emitter source consists of a ferromagnetic, FM, and nonmagnetic, NM, (FM/NM) metal thin film heterostructure. This emitter utilizes the inverse spin-Hall effect (ISHE), a phenomenon that converts the spin current (coming from the FM material) into a transient transverse