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

Judul Jurnal Ilmiah (Artikel)	:	High green-emission carbon dots and its optical properties Microwave power effect
Nama/ Jumlah Penulis	:	6 Orang
Status Pengusul	:	Penulis pertama/ ~~Penulis ke~~ / Penulis Korespondesi **
Identitas Jurnal Ilmiah	:	a. Nama Jurnal : AIP Advances
		b. Nomor ISSN : 2158-3226
		c. Vol, No., Bln Thn : Vol 10 No 5, Mei 2020 Hal 1-6
		d. Penerbit : American Institute of Physics
		e. DOI artikel (jika ada) : https://doi.org/10.1063/5.0004595
		f. Alamat web jurnal : https://aip.scitation.org/doi/10.1063/5.0004595
		Alamat Artikel : https://aip.scitation.org/doi/pdf/10.1063/5.0004595
		g. Terindex : Scopus (Q3, SJR 0,38)

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- [ ] Jurnal Ilmiah Nasional Terakreditasi
- [ ] Jurnal Ilmiah Nasional Tidak Terakreditasi

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Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	**Reviewer II**	
a. Kelengkapan unsur isi jurnal (10%)	4,00	4,00	4,00
b. Ruang lingkup dan kedalaman pembahasan (30%)	12,00	11,00	11,50
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	11,90	12,00	11,95
d. Kelengkapan unsur dan kualitas penerbit (30%)	11,90	12,00	11,95
Total = (100%)			39,40
Nilai untuk Pengusul : 60% 39,40 = 23,64			

Semarang, 8 Maret 2023

Reviewer 1

Prof. Dr. Rahmat Gernowo, M.Si
NIP. 196511231994031003
Unit Kerja: FSM Universitas Diponegoro
Bidang Ilmu: Fisika

Reviewer 2

Prof. Dr. Kusworo Adi, S.Si., M.T.
NIP. 197203171998021001
Unit Kerja: FSM Universitas Diponegoro
Bidang Ilmu: Fisika

LEMBAR
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Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
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a. Kelengkapan unsur isi jurnal (10%)	4			4,00
b. Ruang lingkup dan kedalaman pembahasan (30%)	12			12,00
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12			11,90
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11,90
Total = (100%)	**40**			**39,80**
Nilai Pengusul = 60% x 39,88 = 23,88				

Catatan Penilaian artikel oleh Reviewer :

1. **Kelengkapan unsur isi jurnal:**
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2. **Ruang lingkup dan kedalaman pembahasan:**
   Pembahasan dengan menggunakan metoda yang diusulkan dalam artikel cukup komprehensip. Diskusi telah dilakukan dengan para peneliti lain melalui referensi yang disitasi. Sebuah artikel yang menarik.
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   Data dan referensi mutakhir, termasuk referensi dari kajian yang dilakukan oleh peneliti. Metoda standar dibidangnya dan akan bisa direfleksi oleh peneliti lain sebidang.
4. **Kelengkapan unsur dan kualitas terbitan:**
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Semarang, 1 Maret 2023
Reviewer 1

Prof. Dr. Drs. Rahmat Gernowo, M.Si.
NIP. 196511231994031003
Unit Kerja : Fisika
Bidang Ilmu: Fakultas Sains dan Matematika

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

Judul Karya Ilmiah (Artikel)	:	High green-emission carbon dots and its optical properties Microwave power effect			
Nama/ Jumlah Penulis	:	6 Orang			
Status Pengusul	:	Penulis pertama/ ~~Penulis ke~~ / Penulis Korespondesi **			
Identitas Prosiding	:	a.	Nama Prosiding	:	AIP Advances
		b.	Nomor ISSN	:	2158-3226
		c.	Vol, No., Bln Thn	:	Vol 10 No 5, Mei 2020 Hal 1-6
		d.	Penerbit	:	American Institute of Physics
		e.	DOI artikel (jika ada)	:	https://doi.org/10.1063/5.0004595
		f.	Alamat web prosiding	:	https://aip.scitation.org/doi/10.1063/5.0004595
			Alamat Artikel	:	https://aip.scitation.org/doi/pdf/10.1063/5.0004595
		g.	Terindex	:	Scopus (Q3, SJR 0,38)

Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat) :
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Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	**Nilai Maksimal Jurnal Ilmiah**			**Nilai Akhir Yang Diperoleh**
	Internasional [√]	**Nasional Terakreditasi** [ ]	**Nasional Tidak Terakreditasi** [ ]	
a. Kelengkapan unsur isi jurnal (10%)	4			4,00
b. Ruang lingkup dan kedalaman pembahasan (30%)	12			11,00
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12			12,00
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			12,00
Total = (100%)	**40**			**39,00**
Nilai Pengusul = 60% x 39,00 = 23,4				

Catatan Penilaian artikel oleh Reviewer :

1. **Kelengkapan unsur isi prosiding:** Penulisan artikel sudah baik dan mengikuti standard penulisan artikel di prosiding, yaitu Abstract, Introduction, Materials and Method, Result and Discussion, Conclusions, Acknowledgement and References. Substansi artikel sesuai bidang ilmu pengusul.
2. **Ruang lingkup dan kedalaman pembahasan:** Lingkup bahasan dari artikel ini adalah bidang fisika. Pembahasan cukup baik yaitu mengetahui pengaruh daya gelombang mikro terhadap karakteristik optik CD dengan menggunakan teknik radiasi gelombang mikro. CD disintesis dengan asam sitrat sebagai sumber karbon dan urea sebagai agen pasivasi. CD telah berhasil disintesis, dan peningkatan persentase pembakaran CD diamati dengan peningkatan daya gelombang mikro. Kedalaman pembahasan baik.
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:** Informasi yang disajikan cukup baru dan hasil yang diperoleh memuat substansi orisinil dengan aspek aplikasi yang penting. Sumber gagasan penulis untuk artikel ini banyak dan komprehensif. Dari 35 referensi yang dipakai terdapat 3 paper yang lebih dari 10 tahun terakhir (out of date). Metodologinya baik dan penulisannya terstruktur.
4. **Kelengkapan unsur dan kualitas terbitan:** Artikel dimuat di Prosiding AIP Advances, pada Vol 10 No 5, Mei 2020 Hal 1-6. Diterbitkan oleh American Institute of Physics. Prosiding terindeks Scopus (Q3, SJR 0,38).

Semarang, 1 Maret 2023
Reviewer 2

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Unit Kerja: Fakultas Sains dan Matematika

AIP Advances • *Open Access* • Volume 10, Issue 5 • 1 May 2020 • Article number 055008

Document type
Article • *Gold Open Access*

Source type
Journal

ISSN
21583226

DOI
10.1063/5.0004595

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High green-emission carbon dots and its optical properties: Microwave power effect

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[a] Department of Physics, Diponegoro University, Jl. Prof. Soedharto SH, Semarang, 50275, Indonesia
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Abstract

The nature of carbon quantum dot (CD) luminescence is still broadly investigated based on different CD synthesis processes. This study aims at investigating the effect of microwave power on optical characteristics of CDs using microwave radiation techniques. CDs are synthesized with citric acid as a source of carbon and urea as a passivation agent. CDs have been successfully synthesized, and an increase in the CD burn-off percentage was observed with an increase in the microwave power. The

Abstract
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Metrics
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TEM test results show that the dimensions of the CDs resulted are in the range of 3.4-9.5 nm with an average size of 6 nm at 450 W. The results of the FTIR functional group structural analysis show that a CD has N-H and O-H stretching bonds. According to the results of UV-Vis analysis, the CDs have absorption peaks at 335 nm and 407 nm, which indicates a $\pi \rightarrow \pi^*$ electronic transition from the C=C bond and an $n \rightarrow \pi^*$ transition from the C=O bond. Using the Tauc-plot method, the CD energy bandgap values were found to be 2.47 eV, 2.51 eV, 2.51 eV, 2.52 eV, and 2.53 eV at CD 300, CD 450, CD 600, CD 850, and CD 1000, respectively. The optical multichannel analyzer test results show that the peak emission waves produced by CDs are 536 nm and 532 nm with the strongest bright green light at CD 1000. Time-resolved photoluminescence testing shows that the CD decay time generally ranges from 5 ns. Overall, an increase in the microwave power causes an increase in the percentage of burn-off, energy bandgap, absorption intensity, and CD emission intensity. © 2020 Author(s).

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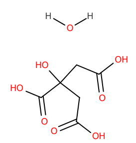

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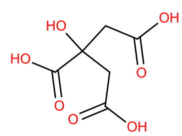

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Source details

AIP Advances

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Scopus coverage years: from 2011 to Present

Publisher: American Institute of Physics

ISSN: 2158-3226

Subject area: Physics and Astronomy: General Physics and Astronomy

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Javier E. Garay
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Javier E. Garay is a professor in the department of Mechanical and Aerospace Engineering and the Materials Science and Engineering Program at the Jacobs School of Engineering at University of California, San Diego (UCSD). He received his B.S. in Mechanical Engineering, his M.S. and Ph.D in Materials Science and Engineering all from the University of California, Davis. During his PhD studies, he also worked at the Lawrence Livermore National Laboratory where he studied material defects using positron annihilation spectroscopy. Prior to his position at UCSD, he was a professor at UC Riverside where he also served as Chair of the Materials Science & Engineering Program.

As the director of the Advanced Material Processing and Synthesis (AMPS) Lab at UCSD, Professor Garay focuses his research on materials property measurements, the integration of materials in devices with application in optical devices, magnetic devices, thermal energy storage/ management, and materials synthesis and processing with an emphasis on designing the micro/nanostructure of bulk materials/thin films for property optimization. He is also particularly interested in understanding the role of the length scale of nano-/ micro-structural features on light, heat and magnetism.

A. T. Charlie Johnson Jr.
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Philadelphia, PA, USA

A.T. Charlie Johnson is a professor of physics in the Department of Physics and Astronomy at the University of Pennsylvania. He received his B.S. in physics from Stanford University and his Ph.D. in physics from Harvard University. He did postdoctoral fellowships at the Delft University of Technology (Applied Physics) and NIST (Cryoelectronic Metrology). His honors include the Christian R. and Mary F. Lindback Foundation Award for distinguished teaching at Penn, the Jack Raper Outstanding Technology Directions Paper Award of the International Solid State Circuit Conference, an Alfred P. Sloan Research Fellowship, and a Packard Fellowship for Science and Engineering.

Dr. Johnson's research is focused on the nano-scale transport properties (charge, energy, spin, etc.) of nanostructures and single molecules, including carbon nanotubes, graphene, DNA, synthetic proteins, and other biomolecules. He is particularly interested in the physical properties of hybrid nanostructures and their use in molecular sensing. Other research interests include the development of scanning probe techniques for electronic property measurement of nanomaterials and nanodevices, molecular electronics and nanogaps, local probes of nanoscale systems, and nanotube and nanowire electronics.

Ben Slater
University College London (UCL),
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Ben Slater is a reader at UCL Chemistry. He received his BSc in chemistry from the University of Nottingham and was awarded his PhD at the University of Reading. He did postdoctoral work at the Royal Institution of Great Britain (Ri) and became an assistant director of the Davy Faraday Research Laboratory at the Ri in 1999. He joined UCL Chemistry in 2007 and was awarded the Royal Society of Chemistry Barrer prize in 2008.

Dr. Slater's research is focused on using atomistic computer simulation to understand and predict the structure and properties of materials. He has published extensively in the area of porous materials (including zeolites and metal-organic frameworks) and water ices. He has a particular interest in defects in materials and surface mediated processes, such as crystal growth.

Masaaki Tanaka
The University of Tokyo,
Tokyo, Japan

Masaaki Tanaka is a professor at the Department of Electrical Engineering & Information Systems Graduate School of Engineering, University of Tokyo. He received his Ph.D. in electronic engineering from the University of Tokyo in 1989. In 1992, he joined Bell Communications Research (Bellcore) at Red Bank, New Jersey, as a visiting research scientist. Since 1994, he has been at the University of Tokyo as an associate professor and professor.

Dr. Tanaka's main research field is spin electronics ("spintronics"), in which the spin degrees of freedom are used in artificially synthesized materials. Among the areas of his specific research are epitaxial growth, structural characterizations, electronic/optical/magnetic /spin-related properties (in particular, spin-dependent transport and mageto-optical properties), and device applications of various new structures. His research on structures and devices includes ferromagnetic metal / semiconductor hybrid structures, III-V-based magnetic semiconductors and their heterostructures, group-IV-based magnetic semiconductors, ferromagnetic nanoparticles and semiconductor hybrid heterostructures, delta doping of magnetic impurities in semiconductor heterostructures, and new spin transistors (e.g., spin-MOSFET) and reconfigurable logic devices.

Enge G. Wang
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Professor Enge G. Wang is a professor of physics at Peking University and an academician at the Chinese Academy of Sciences.

ang's research focuses on surface physics; the approach is a combination of atomistic simulation of nonequilibrium growth, chemical vapor deposition of light-element nanomaterials, and water behaviors in confinement system. He and his coworkers also predicted a three-dimensional Ehrlich-Schwoebel barrier, which attracted News and Views in Nature (June 2002). Another contribution is the model proposal and experimental validation of a true upward atomic diffusion. This was reported in Physics News Update in June 2003 and News and Views in Nature as well as Science Week in June 2004.

His work on water-surface coupling and the strength of hydrogen bonds at the interfaces provides a fundamental understanding of water on surface at the molecular level.

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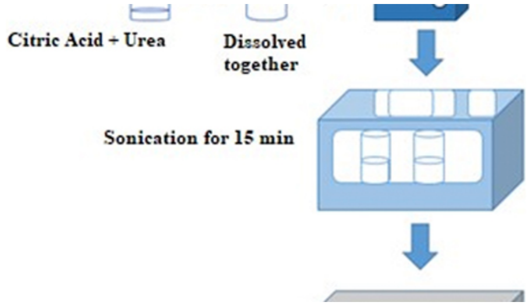

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High green-emission carbon dots and its optical properties: Microwave power effect

H. Sutanto, I. Alkian, N. Romanda, I. W. L. Lewa, I. Marhaendrajaya and P. Triadyaksa

AIP Advances **10**, 055008 (2020); https://doi.org/10.1063/5.0004595

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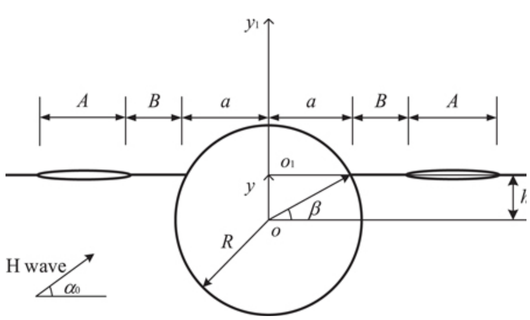

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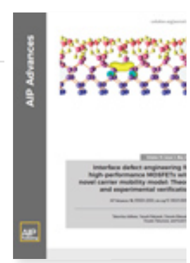

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Review on the exploration of condensed carbon formation mechanism in detonation products

Cite as: AIP Advances 10, 050701 (2020); doi: 10.1063/1.5142521
Submitted: 14 December 2019 • Accepted: 16 March 2020 •
Published Online: 7 May 2020

View Online Export Citation CrossMark

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ABSTRACT

As the only solid detonation product of CHNO negative oxygen balance explosive, the condensed carbon plays an important role in the energy-releasing and working capability by coagulation and phase transition. But the process of condensed carbon transformation has always been controversial because the detonation is so fast and the carbon phase is so complex (amorphous phase, graphite phase, diamond phase, liquid phase, etc.), that spatial and temporal resolution of existing test techniques is difficult to meet the requirements of quantitative analysis. If we can accurately understand the phase transition and coagulation process of carbon condensation during detonation, we can provide effective reference data for the accurate evaluation of explosive energy release process and damage effect, rational design of formula, and accurate correction of non-ideal explosive detonation model.

I. INTRODUCTION

The thermodynamic calculation of detonation products has important applications in estimating the ability of explosives to do work and predicting the performances of new explosives. The predecessors studied various gas product state equations and solid product state equations, and developed the calculation programs for equations of state such as BKW using Fortran language to calculate the detonation parameters of various explosives.[1,2] some values cannot be accurately determined in the detonation parameters of explosives, such as the detonation temperature, the composition of detonation product in the CJ state, the temperature and varied composition during the isentropic expansion, etc. However, these parameters are very important for the application of explosives. For example, calculating the equation of state (EOS) for a mixture of detonation products theoretically is very important for evaluating the capacity of explosives to do work; In the study of explosive synthesis, accurately calculating the temperature and composition of the detonation product during the isentropic expansion process is also very important for the design of explosive formulations and explosion processes. During the detonation of explosives, large metastable organic molecules undergo thermal decomposition after impact compression, and then the generated small molecular fragments start to form carbon clusters and are immersed

Electroplated Fe-Co films prepared in citric-acid-based plating baths with saccharin and sodium lauryl sulfate

Cite as: AIP Advances 10, 055001 (2020); doi: 10.1063/1.5130468
Presented: 6 November 2019 • Submitted: 3 October 2019 •
Accepted: 16 April 2020 • Published Online: 4 May 2020

View Online Export Citation CrossMark

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Note: This paper was presented at the 64th Annual Conference on Magnetism and Magnetic Materials.
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ABSTRACT

We electroplated Fe-Co films in a citric-acid-based plating bath with saccharin and sodium lauryl sulfate and evaluated the magnetic properties of the films. The Fe content in the film can be readily controlled by the change in the ratio of the Fe reagent and the Co one, and the Fe content could be obtained from 10 to 90 at.% in our experimental conditions. The change in the saturation magnetization over the Fe content of the film almost agreed with the expected change from the Slater-Pauling curve. The coercivity decreased with increasing the Fe content. From the structural analysis, we found that the grain size reduced with increasing the Fe content, and the grain refinement effect works effectively to reduce the coercivity.

I. INTRODUCTION

Soft magnetic materials with high saturation magnetization are hopeful for industrial applications, and Fe-Co alloys are well-known as high saturation magnetization materials. Taking into the high saturation magnetization, some Fe-Co films with good soft magnetic properties have been reported[1–6] and are typically fabricated by sputtering, vapor deposition, and electroplating.

Electroplating is one of the attractive methods to obtain thick-films due to the high deposition rate and high economic viability, and we have reported the fabrication process of Fe-Ni thick-films (>1 μm) using electroplating with high deposition rate (>100 μm/h). In our previous studies on the electroplated Fe-Ni films, citric acid was a good complex agent to stabilize plating baths and to obtain good soft magnetic properties.[7–9] From these hopeful results, we also employed a citric-acid-based plating bath to fabricate Fe-Co films with good magnetic properties.[10] More recently, we introduced a deep eutectic solvent (DES) as a solvent for electroplating of Fe-Co films to obtain high current efficiency of the plating process.[11]

Although the above-mentioned Fe-Co films have high saturation magnetization, the coercivity is typically higher than that of Fe-Ni ones. In soft magnetic materials, one of the popular ways to reduce the coercivity is a reduction in grain size.[12] In fact, we confirmed that Fe-Ni films electroplated in the citric-acid-based plating baths have small grains (<50 nm), and the fine structure effectively works to realize good soft magnetic properties.[13–15] For improvement in the magnetic properties of Fe-Co films, we focused on the grain size. In the present study, we employed a citric-acid-based plating bath with additives of saccharin and sodium lauryl sulfate and evaluated the magnetic and structural properties of the films.

II. EXPERIMENTAL PROCEDURES

A. Electroplating

We electroplated Fe-Co films on Cu substrates using a direct current. The composition of the plating bath and the plating conditions are shown in Tables I and II, respectively. In our previous study of the citric-acid-based bath,[10] a large amount of citric acid (>100 g/L) was added into the plating baths. We recently confirmed that the current efficiency of the process for the Fe-Ni films decreased with increasing the citric acid,[9] indicating that a large amount of the

Charge carrier density, mobility, and Seebeck coefficient of melt-grown bulk $ZnGa_2O_4$ single crystals

Cite as: AIP Advances 10, 055005 (2020); doi: 10.1063/5.0002847
Submitted: 28 January 2020 • Accepted: 9 April 2020 •
Published Online: 5 May 2020

View Online Export Citation CrossMark

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ABSTRACT

The temperature dependence of the charge carrier density, mobility, and Seebeck coefficient of melt-grown, bulk $ZnGa_2O_4$ single crystals was measured between 10 K and 310 K. The electrical conductivity at room temperature is about $\sigma = 286$ S/cm due to a high electron concentration of $n = 3.26 \times 10^{19}$ cm^{-3} caused by unintentional doping. The mobility at room temperature is $\mu = 55$ cm^2/V s, whereas the scattering on ionized impurities limits the mobility to $\mu = 62$ cm^2/Vs for temperatures lower than 180 K. The Seebeck coefficient relative to aluminum at room temperature is $S_{ZnGa_2O_4-Al} = (-125 \pm 2)\ \mu$V/K and shows a temperature dependence as expected for degenerate semiconductors. At low temperatures, around 60 K, we observed the maximum Seebeck coefficient due to the phonon drag effect.

I. INTRODUCTION

Transparent conducting oxides (TCOs) have drawn attention due to their possible application in high-power, optical, or gas sensing devices.[1–8] Recently, β-Ga_2O_3 and related semiconducting oxides with ultra-wide bandgaps of over 4 eV are in the focus, since they offer transparency in the visible spectrum, semiconducting behavior, and breakthrough electric fields of several MV/cm. The fundamental research has been extended from binary to ternary and quaternary systems to find new substrate material for epitaxial thin film growth, as well as to make use of a higher degree of freedom in terms of doping.[9]

$ZnGa_2O_4$ is a novel ternary conducting oxide that crystallizes in the spinel crystal structure, which makes it interesting as a substrate for ferrite spinels.[9] Furthermore, the material might be promising for electrical application, which gives rise to a study of the fundamental electric and thermoelectric transport properties. The isotropic thermal conductivity at room temperature is $\lambda = 22$ W/mK,[9] but many other material parameters remain to be clarified.

Theoretical values for the bandgap of $ZnGa_2O_4$ were predicted to be indirect (K-Γ) with values between 2.69 eV–4.71 eV[10–16] or direct (Γ-Γ) with a value of 2.79 eV.[17] The experimental bandgap was found at values of 4.0–5.0 eV measured on synthetized ZnO:Ga_2O_3 powders,[18] ceramics,[19] films obtained by mist-CVD,[20] films obtained by sol–gel,[21] and bulk crystals obtained by the flux method,[22] while the experimental optical bandgap measured on bulk single crystals obtained from the melt is 4.6 eV.[9] Theoretically calculated effective masses are in the range of $m^* = 0.22$–$0.66\ m_e$.[13,15–17] Little is known about electric transport parameters. On the one hand, $ZnGa_2O_4$ ceramics show low electrical conductivity ($\sigma_{ZnGa_2O_4,\mathrm{ceram.}} \approx 30$ S/cm[19]). On the other hand, melt-grown bulk single crystals showed a high electrical conductivity of about 50–500 S/cm.[9]

In this work, we investigate as-grown bulk $ZnGa_2O_4$ of blueish coloration and perform temperature-dependent Seebeck, van der Pauw, and Hall measurements between $T = 10$ K and $T = 310$ K. We discuss the results in terms of electron scattering processes and thermoelectric effects observed using a degenerate semiconductor.

A broad energy range (100 MeV–10 GeV) electron spectrometer for high power laser wakefield acceleration experiments

Cite as: AIP Advances 10, 055006 (2020); doi: 10.1063/5.0001980
Submitted: 19 February 2020 • Accepted: 15 April 2020 •
Published Online: 5 May 2020

View Online Export Citation CrossMark

Deepak Sangwan, Soiciro Aogaki, Septimiu Balascuta, Florin Rotaru, Petru Ghenuche, Mihai Risca, Dan Stutman, and Bogdan Diaconescu[a)]

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ABSTRACT

Laser wakefield acceleration is able to provide electron beams of GeV energy and continuously evolves toward higher energies. These beams have broad energy spectrum; hence, their measurements require diagnostics with wide energy acceptance. Here, we present a design of an electron spectrometer to characterize the beams in the energy range of 100 MeV–10 GeV, in a single shot. The design consists of 1-m long permanent dipole magnets and has a variable gap opening to accommodate different divergences and pointings of the electron beams. The design is backed by simulations, which are used to optimize the positions of imaging plates. The use of a collimator to improve the energy resolution in the case of large beam divergences and beam pointing is presented. We also present the Monte Carlo simulations to evaluate the signal to noise ratio, with and without a collimator.

I. INTRODUCTION

A giga-electron volt (GeV) electron spectrometer is an essential diagnostic for the laser wakefield acceleration (LWFA) experiments.[1–17] With the advent of high power lasers, the electrons of the order of multi GeV energy are achieved in LWFA experiments. The motivations behind the study and generation of the GeV energy electron beams by LWFA are the possibility of tabletop accelerators for the QED studies and ultra-short and coherent x-ray sources for biology, material science, chemistry, and medicine.[18,19]

In the last two decades, several groups have shown that the lasers with up to petawatt (PW) power are capable of generating the relativistic electrons of ~GeV energy.[1–11] Such high energy electrons can be achieved within a cm-scale plasma by the LWFA. In this regime of acceleration, a laser wake electric field of the order of 100 GV/m or more is generated. The magnitude of the wake electric field depends on the strength of the laser. The laser strength is measured in terms of normalized vector potential $a_o = 8.5 \times 10^{-10}\, \lambda[\mu m](I_o[W/cm^2])^{1/2}$, where λ is the laser wavelength and I_o is the peak intensity of the laser. It has been found both theoretically and experimentally that, to be capable of generating ~GeV energy electrons, a_o has to be greater than 1.[12–14] LOASIS group have used a laser with $a_o = 1.4$ and ~40 fs pulse duration in order to get 1.1 GeV electrons with a divergence of 2.5 mrad and beam pointing between 2 mrad and 6 mrad.[12] Similarly, BELLA group used $a_o = 1.6$ with a pulse duration of ~40 fs and got 4.2 GeV electrons with 0.3 mrad divergence and beam pointing larger than 1 mrad.[13] Recently, the same group has used $a_o = 2.2$ with a pulse duration of 35 fs and got 7.8 GeV electrons with a divergence of 0.6 mrad and beam pointing greater than 1 mrad.[14] Extreme Light Infrastructure-Nuclear Physics (ELI-NP) will use 10 PW laser of pulse duration ~25 fs and λ = 820 nm, which allow for $a_o > 4$. Therefore, electron beams with energies of 10 GeV or more are very likely.[14]

In order to use the GeV electron beams, their thorough characterization is necessary, including the energy spread and the beam