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

Judul Jurnal Ilmiah (Artikel) : Metal powder-assisted laser induced breakdown spectroscopy (LIBS) using pulse CO₂ laser for liquid analysis

Nama/ Jumlah Penulis : 4 Orang

Status Pengusul : Penulis pertama/ ~~Penulis ke~~ / Penulis Korespondensi **

Identitas Jurnal Ilmiah :

- a. Nama Jurnal : Journal of King Saud University – Science
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- c. Vol, No., Bln Thn : Vol 34, April 2022
- d. Penerbit : Elsevier
- e. DOI artikel (jika ada) : 10.1016/j.jksus.2022.101901
- f. Alamat web jurnal : <https://www.sciencedirect.com/science/article/pii/S1018364722000829>
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- g. Terindex : Scopus

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b. Ruang lingkup dan kedalaman pembahasan (30%)	11	11,9	11,45
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	12	11,9	11,95
d. Kelengkapan unsur dan kualitas penerbit (30%)	12	12	12
Total = (100%)	39	39,8	39,4
Nilai untuk Pengusul : (60% x 39,4) = 23,64			

Semarang, 5 Maret 2022

Reviewer 1



Prof. Dr. Kusworo Adi, S.Si., M.T.
 NIP. 197203171998021001
 Bidang ilmu/Unit kerja : Fakultas Sains dan Matematika/Fisika

Reviewer 2



Dr. Eng. Eko Hidayanto, S.Si., M.Si.
 NIP. 197301031998021001
 Bidang ilmu/Unit kerja : Fakultas Sains dan Matematika/Fisika

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Judul Jurnal Ilmiah (Artikel) : Metal powder-assisted laser induced breakdown spectroscopy (LIBS) using pulse CO2 laser for liquid analysis

Nama/ Jumlah Penulis : 4 Orang

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b. Ruang lingkup dan kedalaman pembahasan (30%)	12,00			11,00
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	12,00			12,00
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12,00			12,00
Total = (100%)	40,00			39
Nilai Pengusul = 60% x 39 = 23,4				

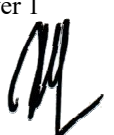
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Semarang, 04 Maret 2022
Reviewer 1

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Bidang Ilmu: Fisika

LEMBAR
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b. Ruang lingkup dan kedalaman pembahasan (30%)	12			11,9
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	12			11,9
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			12
Total = (100%)	40			39,8
Nilai Pengusul = 60% x 39,8 = 23,9				

Catatan Penilaian artikel oleh Reviewer :

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Paper ini membahas tentang Analisis pengotor dan elemen jejak dalam cairan sangat dibutuhkan di lingkungan dan industri dengan teknik laser induced breakdown spectroscopy (LIBS).

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

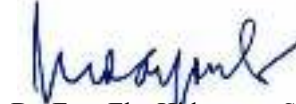
Data-data hasil yang diperoleh dalam penelitian mutakhir dengan didukung metodologi yang tepat.

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Semarang, 05 Maret 2022

Reviewer 2



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

NIP. 197301031998021001

Unit Kerja : Fisika

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Metal powder-assisted laser induced breakdown spectroscopy (LIBS) using pulse CO₂ laser for liquid analysis

[Khumaeni A.^a](#) , [Budi W.S.^b](#), [Kurniawan K.H.^c](#), [Kurihara K.^c](#) [Save all to author list](#)^a Department of Physics, Faculty of Science and Mathematics, Diponegoro University, Jl. Prof. Soedharto, SH., Tembalang, Semarang, 50275, Indonesia^b Maju Makmur Mandiri Research Center, 40 Srengseng Raya, Kembangan, Jakarta Barat, 11630, Indonesia^c Department of Physics, Faculty of Education, University of Fukui, Bunkyo 3-9-1, Fukui, 910-8507, Japan [View PDF](#) [Full text options](#) ▼[Abstract](#)[Author keywords](#)[Reaxys Chemistry database information](#)[SciVal Topics](#)[Citations](#)[Funding details](#)**Abstract**

Analysis of impurity and trace element in liquid is urgently needed in environment and industries. In this present work, new sampling technique of laser induced breakdown spectroscopy (LIBS) has been devised using metal coarse utilizing pulse CO₂ laser. Experimentally, a liquid and polluted liquid was dropped into a metal coarse powder. A pulse CO₂ laser (10.6 μm, 200 ns) beam with a laser energy from 0.75 to 1.5 J was bombarded on a metal coarse to induce a plasma. The plasma contains elemental analytical lines obtained from the liquid material; the metal coarse itself is never ablated and only works to induce a plasma. By this present technique, identification of major and minor elements in liquid material target such as commercial milk liquid and multi-vitamin liquid has successfully be made. Furthermore, a quantitative analysis of impurity of Cr has been demonstrated, resulting in good precision and good sensitivity with limit of detection of approximately 2 μg/ml. This present developed

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Tian, Y. , Yan, C. , Zhang, T. (2017) *Spectrochimica Acta - Part B Atomic Spectroscopy*

Analysis of viscous liquids and powders with laser- induced breakdown spectroscopy: The principle and some applications

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Physics

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Fabrication of high voltage gradient ZnO nanoparticle-Bi₂O₃-Mn₂O₃-based thick film varistors at various sintering temperature

Rabab Khalid Sendi

Article 101820

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Abstract

Abstract

In this research, 20 nm zinc oxide nanoparticles were utilized to fabricate significant voltage gradient zinc oxide nanoparticle-Bi₂O₃-Mn₂O₃-based thick film varistors (TFVs) by applying screen printing method. Different low temperatures during the sintering process had a considerable effect on the zinc oxide nanoparticle-based TFVs. In particular, the low temperatures improved the growth of ZnO grains, which was obvious even at 550 °C. The huge

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Abstract

This is the first report describing the Molecular Dynamics (MD) simulation and complete green nanochemistry approach to investigate the interaction of CuO-MgO nanocomposite against methylene blue (MB) dye. The CuO-MgO nanocomposite was synthesized using African natural extract derived from agro-waste, date pits, and subsequently characterized via various characterization techniques.

Quantitative analysis of XRD data via MAUD software revealed monoclinic and cubic structures with particle sizes of 26.7 and 21.4 nm for CuO and MgO nanoparticles, respectively. While HRTEM analysis presents cubic shaped morphology, SAED images revealed lattice fringes with d- spacing 0.243 nm, 0.176 nm, 0.126 nm, and 0.102 nm corresponding respectively to (1 1 1), (1 1 2), (3 1 1), and (4 0 0) reflection of the CuO-MgO.

Research article Open access

Metal powder-assisted laser induced breakdown spectroscopy (LIBS) using pulse CO₂ laser for liquid analysis

Ali Khumaeni, Wahyu Setia Budi, Koo Hendrik Kurniawan, Kazuyoshi Kurihara

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Abstract

Abstract

Analysis of impurity and trace element in liquid is urgently needed in environment and industries. In this present work, new sampling technique of laser induced breakdown spectroscopy (LIBS) has been devised using metal coarse utilizing pulse CO₂ laser. Experimentally, a liquid and polluted liquid was dropped into a metal coarse powder. A pulse CO₂ laser (10.6 μ m, 200 ns) beam with a laser energy from 0.75 to 1.5 J was bombarded on a metal coarse to induce a plasma. The plasma contains elemental analytical lines obtained from the liquid material; the metal coarse itself is never ablated and only works to induce a plasma. By this present technique, identification of major and minor elements in liquid material target such as commercial milk liquid and multi-vitamin liquid has successfully be made. Furthermore, a quantitative analysis of impurity of Cr has been demonstrated, resulting in good precision and good sensitivity with limit of detection of approximately 2 μ g/ml. This present developed technique is possible to be employed for analysis of major impurity

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Tarig M. Elzaki, Shams A. Ahmed, Mounirah Areshi, Mourad Chamekh

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Abstract

Abstract



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Original article

Fabrication of high voltage gradient ZnO nanoparticle-Bi₂O₃-Mn₂O₃-based thick film varistors at various sintering temperature

Rabab Khalid Sendi

Umm Al- Qura University (UQU), Faculty of Applied Science, Physics Department, 21955 Makkah Al-Mukarramah, Saudi Arabia



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ABSTRACT

In this research, 20 nm zinc oxide nanoparticles were utilized to fabricate significant voltage gradient zinc oxide nanoparticle-Bi₂O₃-Mn₂O₃-based thick film varistors (TFVs) by applying screen printing method. Different low temperatures during the sintering process had a considerable effect on the zinc oxide nanoparticle-based TFVs. In particular, the low temperatures improved the growth of ZnO grains, which was obvious even at 550 °C. The huge surface area of the 20 nm zinc oxide encouraged an intense surface interaction even at minimal sintering temperatures. The sintering technique also enhanced the internal structure of the crystal. Minimizing the fundamental compressive stress depended on the XRD lattice constant and the FWHM analysis. The variable temperatures of the sintering process considerably impacted the electrical behaviours of the samples. A remarkable increase in the voltage gradient of the varistor sintered up to 5732.5 V/mm at 700 °C was observed. The electrical resistivity dropped dramatically from 621.8 kΩ.cm (varistor at 550 °C) to 147.3 kΩ.cm at 800 °C sintering temperature. The small size of grains with perfect boundaries was the main reason for the enhancement of the voltage gradient. The optimal electrical characteristics with a 63 nonlinearity coefficient and 103 μA leakage current were achieved in the varistor sintered at 700 °C. Moreover, maximum permittivity and minimum dissipation factor were attained through the minimal frequency range. Therefore, the sintering process could be applied as a novel technical approach for the dominant voltage gradient of zinc oxide nanoparticle-based TFVs with enhanced microstructural and electrical behavior and good nonlinearity.

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1. Introduction

Electrical and electronic techniques, such as a surge protection system, have been applied to the varistor system for many years due to optimal nonlinearity exponent and minimal leakage current. Several electrical parameters, such as break down voltage and resistivity value of these systems, rely significantly on structural status; consequently, the grain size and structural uniformity are among the factors with the greatest influence in a varistor fabrication technique (Takada and Yoshikado, 2010).

Significant requirements exist for varistors existence miniature and combination with huge voltage gradient (Chen et al., 2017). Commercial zinc oxide varistors are ceramic discs that are unable

to meet the requirements for certain implementations, such as a varistors array, surface applied techniques, and others. Considering the fact that they are huge products with minimum value and ingenious design, zinc oxide-based thick film varistors (TFVs) are fabricated to become appropriate exchanges and to obtain the general interest (Debeda-Hickel et al., 2005; Jadhav et al., 2016; Paun, 2017).

There are many techniques (Jadhav et al., 2016; Paun, 2017; Al Abdullah et al., 2017; De La Rubia, 2017; de la Rubia et al., 2004) used to prepare zinc oxide-based TFVs; these techniques include sol-gel technique, screen printing, direct-writing technique, and so on. Khalaf et al. (Al Abdullah et al., 2017) fabricated TFVs via a sol-gel technique using 200 μm film thickness at 1000 °C sintering temperature. Paun et al. (Paun, 2017) obtained zinc oxide-based TFVs via direct write method using Na dopant with 1200 V/mm voltage gradient; they clarified that zinc oxide-based TFVs can be sintered at 900 °C. Rubia et al. (De La Rubia, 2017) prepared the zinc oxide-based TFVs with a huge voltage gradient rate of approx-

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Original article

Optical, structural and semiconducting properties of Mn doped TiO₂ nanoparticles for cosmetic applications

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Seebeck effect

ABSTRACT

Titanium dioxide (TiO₂) nanoparticles, have been routinely used in cosmetic and sunscreen applications, due to their ability to absorb in the UV spectrum. Nevertheless, one of the main disadvantages has been the generation of reactive oxygen species (ROS), especially the hydroxyl radical, upon photoexcitation of titania. In this work, we investigate TiO₂ nanoparticles doped with 0.6–0.7% manganese (Mn), based in the more stable rutile polymorph of titania. In particular, while the anatase crystal form has the ability to destroy almost any organic matter under UV illumination, rutile is less photoreactive, and with Mn doping its photoactivity is reduced further. In particular, we study its optical, structural and semiconducting properties via the Seebeck effect and show that the material displays p-type characteristics. This is very significant because it shifts the energy levels with respect to formation of hydroxyl free radicals. This ensures that for Mn doped p-type titania it is not energetically possible for the hole created in the valence band by photoexcitation to create an OH· free radical and this may explain its low photoreactivity. It also means that this material can act as a very effective scavenger for hydroxyl free radicals.

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1. Introduction

TiO₂ is a semiconducting material that has received wide attention ever since Fujishima and Honda (1972) discovered the photocatalytic splitting of water on a TiO₂ electrode under ultraviolet (UV) light. Over the past decades, TiO₂ has found applications in many promising areas ranging from photovoltaics and photocatalysis, to pigments and cosmetic applications (Hashimoto et al., 2005, Ahmad et al., 2018). In addition, TiO₂ is attractive as it can be mass-produced at a low cost in different sizes, shapes and phase compositions, each possessing unique physiochemical properties. These include microspheres, nanorods, nanotubes and nanowires, for numerous applications (Krishnan et al., 2021).

In the field of personal care products and cosmetics, TiO₂ can be found in a number of preparations. In particular, titania is incorporated in microcrystalline form in toothpastes, as a whitener and an abrasive as well as in different soaps, hair colours and skin products as a pearlescent colorant and opacifier (Berardinelli and Parisi, 2021). Its bright white appearance, originates from its light scattering properties and large refractive index (Bodurov et al., 2014). Currently it is approved for use in cosmetic and personal care products, both by the US Food and Drug Administration (FDA, 2021), as well by the EU Commission via regulation 1857/2019 (EU, 2019). In the area of sunscreen applications, TiO₂ has been used in its nanoform for a number of years, considering that at sizes below 100 nm, its whiteness is displaced by transparency, which creates a favourable appearance when applied to skin (Tanvir et al., 2015). In addition, as a result of particle size reduction, there is a shift of its absorption spectrum from the UVA to the UVB, which is mostly responsible for sunburns and skin cancer. Currently TiO₂ is approved in sunscreen formulations, in concentrations between 2% and 15%, while its loading can reach up to 25% in preparations (Morsella et al., 2016). Nevertheless, one of the main disadvantages of TiO₂ is the generation of reactive

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