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

Judul Karya Ilmiah (Artikel) : Ag doped ZnO thin films synthesized by spray coating technique for methylene blue photodegradation under UV irradiation

Jumlah Penulis : 5 orang

Status Pengusul : ~~Penulis pertama/~~ Penulis ke-4/ ~~Penulis Korespondensi~~ **

Identitas Jurnal Ilmiah : a. Nama Jurnal : International Journal of Chemical Engineering
 b. Nomor ISSN : 1687-8078
 c. Volume, Nomor, Bulan, Tahun : Vol. 2016 , No. -, Februari 2016
 d. Penerbit : Hindawi
 e. DOI artikel (jika ada) : <https://doi.org/10.1155/2016/6195326>
 f. Alamat web jurnal : <https://www.hindawi.com/journals/ijce/2016/6195326/>
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Semarang, 26 Mei 2022

Reviewer 1

Reviewer 2



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Prof. Dr. Kusworo Adi, S.Si., M.T.
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d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			12
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Nilai Pengusul =			$0,11 \times 38,5 / 4 = 3,85$	38,5

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 Baik 4 tahun 17 pustaka lebih 5 tahun

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Semarang, 26 Mei 2022

Reviewer 1

Prof. Dr. Drs. Wahyu Setia Budi, M. S.

NIP. 195806151985031002

Unit Kerja : Fisika

Bidang Ilmu: Fakultas Sains dan Matematika

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2. Ruang lingkup dan kedalaman pembahasan:

Paper ini membahas tentang sintesis lapisan tipis ZnO yang didoping Ag pada substrat kaca dengan teknik spray coating. Struktur, morfologi, dan sifat optik dievaluasi dengan difraktometer sinar-X (XRD), mikroskop elektron pemindaian (SEM), dan spektrofotometer UVVis. Sifat optik film tipis Ag-ZnO menunjukkan bahwa transparansi menurun seiring dengan peningkatan kandungan Ag. Spektrum absorbansi film tipis sedikit bergeser ke panjang gelombang yang lebih tinggi dan ZA25 memiliki celah energi terendah sekitar 2,98 eV.

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

Data-data yang digunakan baik dan didukung metodologi yang baik dengan jumlah referensi kurang dari 5 tahun sejumlah 13.

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Karya ini diterbitkan dalam jurnal berkualitas Q2 dengan SJR 0,34 oleh Hindawi Publishing Corporation dengan unsur-unsur yang lengkap serta kualitas yang sangat baik.

Semarang, 9 Juni 2022

Reviewer 2



Prof. Dr. Kusworo Adi, S.Si., M.T. NIP.
197203171998021001

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Ag doped ZnO thin films synthesized by spray coating technique for methylene blue photodegradation under UV irradiation

[Sutanto, Heri^a](#) [Wibowo, Singgih^a](#) [Nurhasanah, Iis^a](#) [Hidayanto, Eko^a](#) ;[Hadiyanto H.^b](#)[Save all to author list](#)^a Department of Physics, Diponegoro University, Jalan Prof. Soedarto, SH, Tembalang, Semarang, 50275, Indonesia^b Department of Chemical Engineering, Diponegoro University, Jalan Prof. Soedarto, SH, Tembalang, Semarang, 50275, Indonesia30 88th percentile
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Abstract

Silver (Ag) substituted ZnO thin films were successfully deposited onto glass substrates by spray coating technique. Structure, morphology, and optical properties were evaluated by X-ray diffractometer (XRD), scanning electron microscopy (SEM), and UV-Vis spectrophotometer, respectively. XRD spectra had polycrystalline wurtzite structure; SEM images showed that thin films had different surface morphology at different Ag doping concentration. From transmittance spectra, thin films transparency decreased as well as band gap energy along with increase of Ag doping concentration. Methylene blue (MB) solution was used as a pollutant in the photodegradation studies. Under UV light irradiation, the optimal Ag doping is 25%, with 83% of the decolorizing efficiencies after 3 h irradiation time and apparent constant (k_{app}) about $9.69 \times 10^{-3} \text{ min}^{-1}$. © 2016 Heri Sutanto et al.

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Research Article

Effects of Thermal Radiation on Mixed Convection Flow of a Micropolar Fluid from an Unsteady Stretching Surface with Viscous Dissipation and Heat Generation/Absorption

Khilap Singh and Manoj Kumar

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A numerical model is developed to examine the effects of thermal radiation on unsteady mixed convection flow of a viscous dissipating incompressible micropolar fluid adjacent to a heated vertical stretching surface in the presence of the buoyancy force and heat generation/absorption. The Rosseland approximation is used to describe the radiative heat flux in the energy equation. The model contains nonlinear coupled partial differential equations which have been converted into ordinary differential equation by using the similarity transformations. The dimensionless governing equations for this investigation are solved by Runge-Kutta-Fehlberg fourth fifth-order method with shooting technique. Numerical solutions are then obtained and investigated in detail for different interesting parameters such as the local skin-friction coefficient, wall couple stress, and Nusselt number as well as other parametric values such as the velocity, angular velocity, and temperature.

1. Introduction

The micro polar fluids are those which contain microconstituents that can undergo rotation, the presence of which can affect the hydrodynamics of the flow. The classical Navier-Stokes theory does not describe the flow properties of micropolar fluids, for example, colloidal suspension, polymeric fluids, liquid crystals, fluids with additives, suspension solutions, animal's blood, human blood, body fluids, biofluids, and fluids containing certain additives. Eringen [1] describes the theory of micropolar fluids, which show microrotation effects as well as microinertia. The theory of thermomicropolar fluids was developed by Eringen [2] by extending his theory of micropolar fluids. A good list of references for micropolar fluids is available in Łukaszewicz [3]. Many researchers [4–13] have studied the micropolar fluid flow for different fluid properties over different geometries.

Unsteady mixed convection flow plays an important role in chemical engineering, turbomachinery, aerospace technology, geophysics, and so forth; Zueco et al. [14] studied the

unsteady free convection flow of an MHD micropolar fluid through two parallel infinite porous vertical plates. Unsteady mixed convection flow of a micropolar fluid adjacent to a heated vertical surface along with viscous dissipation and the buoyancy force is analyzed by Abd El-Aziz [15]. Hussain et al. [16] reported the radiation effects on the unsteady boundary layer flow of a micropolar fluid over a stretching permeable sheet. Oahimire and Olajuwon [17] studied the heat and mass transfer effects on an unsteady flow of a chemically reacting micropolar fluid over an infinite vertical porous plate. Rashad [18] studied the unsteady MHD boundary-layer flow and heat transfer for an electrically conducting rotating fluid due to a stretching surface in porous medium in the presence of thermal radiation. Abd El-Aziz [19] investigated the effects of variable viscosity on mixed convection flow along a semi-infinite unsteady stretching sheet with viscous dissipation.

The heat transfer in the fluid flow due to a stretching sheet has attracted considerable attention during the last few decades due to its various applications in many industrial

Research Article

Biosorption and Diffusion Modeling of Pb(II) by Malt Bagasse

**Klaiani B. Fontana,¹ Giane Gonçalves Lenzi,¹ Erica R. L. R. Watanabe,¹
Ervin Kaminski Lenzi,² Juliana A. M. T. Pietrobelli,¹ and Eduardo S. Chaves¹**

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The removal of Pb(II) from water by biosorption processes onto malt bagasse was investigated and the kinetic and thermodynamic parameters were obtained; additionally a diffusion modeling was proposed. The characterization of malt bagasse was performed by FTIR and SEM/EDS. The experiments were conducted in batch system and an experimental design based response surface methodology was applied for agitation speed and pH optimization. The kinetics of biosorption followed pseudo-second-order model and the temperature of the process affected the biosorption capacity. Isotherm models of Langmuir, Freundlich, and Elovich were applied and the Langmuir model showed better fit and the estimated biosorption capacity was 29.1 mg g^{-1} . The negative values obtained for ΔG° and positive values of ΔH° confirm, respectively, the spontaneous and endothermic nature of the process. The diffusion modeling was performed based on experiments in the absence of agitation to investigate the influence of the biosorbent on the sorption process of Pb(II) ions.

1. Introduction

The pollution of water by toxic elements such as cadmium (Cd), mercury (Hg), and lead (Pb) generally from industrial wastes is potentially harmful to the health of human beings and the ecosystem [1–4]. Considering the contamination of aquatic systems, Pb is one of the most toxic and problematic elements. The effects of Pb on human's health include kidney damage, inhibition of hemoglobin formation, sterility, and mental retardation [5]. Industrial effluent treatment is normally performed by conventional processes such as precipitation and sludge separation, besides some processes including chemical oxidation and/or reduction, electrochemical treatment, ion exchange, and reverse osmosis that can be also performed. However, some of these methods are costly and have poor efficiency of treatments, concerning metal removing [6]. Consequently, alternative methods, such as biosorption process, for metals removal of effluents have been studied [7–11].

Biomaterials from natural resources or from agricultural products have been applied for preconcentration of metals and as sorbents to remove heavy metal effluents by biosorp-

tion process [11]. Examples of biosorbents are natural spider silk [11], olive tree pruning waste [7], red microalgae [9], orange peel [8], and sugarcane bagasse [10]. A potentially new and low cost biosorbent is malt bagasse, the main subproduct obtained from the beer production process; around 14–20 kg of malt bagasse is generally produced for each 100 L of beer [12]. For textile removal from aqueous solution, malt bagasse was found to be a good biosorbent due to the removal capacity, low cost, and possibility of use without previous treatment [13].

From this point of view, the goal of this work is to investigate the efficiency of malt bagasse in lead ions (Pb(II)) removal by biosorption process. The effects of some experimental parameters on the biosorption of Pb(II) onto malt bagasse were evaluated. Furthermore, the thermodynamic and kinetic parameters were obtained and a diffusion study was performed for the biosorption process. Regarding the last point and its influence on the sorption process, we consider the adsorption of Pb(II) ions from the water in the absence of agitation when it is in contact with a surface that was coated with malt bagasse.