

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

Judul Jurnal Ilmiah (Artikel) : Reduction of Peroxide Value and Free Fatty Acid Value of Used Frying Oil Using TiO₂ Thin Film Photocatalyst

Nama/ Jumlah Penulis : 4 Orang

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

Identitas Jurnal Ilmiah :

- a. Nama Jurnal : Bulletin of Chemical Reaction Engineering & Catalysis
- b. Nomor ISSN : 1975-2993
- c. Vol, No., Bln Thn : Vol 11 No 3, Oktober 2016 Hal 369-375
- d. Penerbit : Universitas Diponegoro
- e. DOI artikel (jika ada) : <https://doi.org/10.9767/bcrec.11.3.577.369-375>
- f. Alamat web jurnal : <https://ejournal2.undip.ac.id/index.php/bcrec/article/view/577>
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- g. Terindex : Scopus (Q3, SJR 0,32)

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Total = (100%)			38,30
Nilai untuk Pengusul : $(40\% \times 38,30) / 3 = 5,11$			

Reviewer 1



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

Semarang, 15 Mei 2023

Reviewer 2



Dr. Eng. Eko Hidayanto
 NIP. 197301031998021001
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 Bidang Ilmu: Fisika

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c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	12			11,5
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11,5
Total = (100%)	40			38
Nilai Pengusul = (40% x 38) / 3 = 5,1				

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2. Ruang lingkup dan kedalaman pembahasan:

3. Artikel ini membahas evaluasi aktivitas fotokatalitik dari film tipis TiO₂ untuk mengurangi PV dan FFA dalam minyak bekas goreng. Fotokatalis dari film tipis TiO₂ berpotensi sebagai metode alternatif baru untuk memurnikan minyak bekas goreng. Paper ini juga dilengkapi dengan referensi pada bagian pembahasan untuk menguatkan diskusi.

4. 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.

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Semarang, 15 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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c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	12			11,7
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11,7
Total = (100%)	40			38,6
Nilai Pengusul = (40% x 38,6) / 3 = 5,15				

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2. Ruang lingkup dan kedalaman pembahasan:

Ruang lingkup dalam artikel ini berfokus pada evaluasi aktivitas fotokatalitik dari film tipis TiO₂ untuk mengurangi PV dan FFA dalam minyak bekas goreng. Film tipis TiO₂ dideposisikan pada substrat kaca dengan metode spray coating. Aktivitas fotokatalitik dari film tipis TiO₂ yang dipanaskan lebih tinggi dibandingkan film tipis TiO₂ tanpa pemanasan mengurangi FFA dan PV pada minyak bekas goreng hingga 67,10% dan 79,15%. Fotokatalis dari film tipis TiO₂ yang dibentuk berpotensi sebagai metode alternatif baru untuk memurnikan minyak bekas goreng.

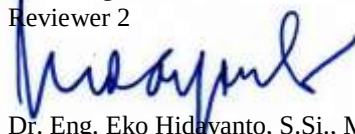
3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

Metode pembentukan film tipis disajikan secara detail dan data yang diberikan diinterpretasikan dalam bentuk grafik, gambar dan diagram sehingga memberikan hasil yang sangat baik.

4. Kelengkapan unsur dan kualitas terbitan:

Artikel ini dipublikasikan di jurnal internasional bereputasi Q3 dengan SJR 0,32. Artikel tersebut memiliki unsur-unsur yang lengkap dan kualitas yang sangat baik.

Semarang, 15 Mei 2023
 Reviewer 2



Dr. Eng. Eko Hidayanto, S.Si., M.Si.
 NIP. 197301031998021001

Unit Kerja : Fisika

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Reduction of peroxide value and free fatty acid value of used frying oil using TiO₂ thin film photocatalyst

Kaltsum, Ummi^a ; Kurniawan, Affandi Faisal^a; **Nurhasanah, Iis^b**; Priyono P.^b

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^a Physics Education Department, Universitas PGRI Semarang, Jln. Sidodadi Timur No.24, Semarang, 50125, Indonesia

^b Physics Department, Universitas Diponegoro, Jl. Prof. Soedarto, Kampus Undip Tembalang, Semarang, 50239, Indonesia

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Effect of cooking pre-treatment on the properties of dried avocado flesh and its oil extract

Arpi, N. , Satriana , Mustapha, W.A.W. (2023) *South African Journal of Chemical Engineering*

Synthesis and Photocatalytic Properties of Cr-doped SrTiCh with Ti Deficiency for Enhanced Photocatalytic Activity

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The role of concentration ratio of TTiP: AcAc on the photocatalytic activity of TiO₂ thin film in reducing degradation products of used frying oil

Kaltsum, U. , Kurniawan, A.F. , Nurhasanah, I. (2017) *Bulletin of Chemical Reaction Engineering & Catalysis*

Cellulose acetate and adsorbents supported on cellulose fiber extracted from waxy corn husks for improving shelf life of frying oil

Udomkun, P. , Innawong, B. , Jumrusjumroendee, N. (2018) *LWT*

Cytotoxicity of used frying oil recovered by different adsorbents

Somnuk, C. , Innawong, B. , Tirawattanawanich, C. (2013) *Kasetsart Journal - Natural*

Abstract

The quality of used frying oil degraded due to the presence of products degradation, such as; PV and FFA which formed during the frying process. PV and FFA are harmful to human health. The photocatalytic activity of TiO₂ thin film has been applied in various fields, especially in the environment. The aim of this study is to evaluate photocatalytic activity of TiO₂ thin film for reducing PV and FFA in used frying

oil. The TiO₂ thin films were deposited on glass substrate by spray coating method at a temperature of 450 °C. The TiO₂ precursor solution was prepared by mixing TTiP, AcAc, and ethanol. The thin films were varied into two conditions; as-deposited and annealed at a temperature of 500 °C. The morphology, crystalline structure, and optical properties of the thin films were characterized by scanning electron microscope (SEM), X-ray Diffraction (XRD), and UV-VIS spectrophotometer, respectively. Photocatalytic process was carried out by putting TiO₂ thin film in used frying oil and irradiated by sunlight. The result showed that both of TiO₂ thin films were still amorphous in nature. However, there was a peak with low intensity for annealed TiO₂ thin film which corresponding to the TiO₂ anatase crystals plane of (101). Annealing process improved crystallinity and changed the shape morphology of TiO₂ thin films. The band gap was found to be 3.59 eV for as-deposited TiO₂ thin film and 3.49 eV for the annealed-TiO₂ thin film. Photocatalytic process shows that TiO₂ thin films reduced FFA and PV of used frying oil up to 67.10% and 79.15%, respectively. The photocatalytic activity of annealed TiO₂ thin film was higher than as-deposited TiO₂ thin film. The results indicated that TiO₂ thin film photocatalyst potential as the new alternative method to purify used frying oil. Copyright © 2016 BCREC GROUP. All rights reserved.

Author keywords

Annealing; FFA; PV; TiO₂; Used frying oil

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Study of physicochemical properties of edible oil and evaluation of frying oil quality by Fourier Transform Infrared (FT-IR) Spectroscopy

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Regeneration of thermally polymerized frying oils with adsorbents

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□ 30 Paz, Y., Heller, A.

Photo-oxidatively self-cleaning transparent titanium dioxide films on soda lime glass: The deleterious effect of sodium contamination and its prevention

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doi: 10.1557/JMR.1997.0367

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✎ Kaltsum, U.; Physics Education Department, Universitas PGRI Semarang, Jln. Sidodadi Timur No.24, Semarang, Indonesia; email:um_mik@yahoo.co.id
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- i** **Forthcoming issue: 2023: BCREC Volume 18 Issue 2 Year 2023 (July 2023, Issue in Progress)** (<https://ejournal2.undip.ac.id/index.php/bcrec/issue/forthComing>)
- i** **A New Issue (Vol. 18 Issue 1 Year 2023, April) has been officially launched** (<https://ejournal2.undip.ac.id/index.php/bcrec/announcement/view/135>)
- i** **Welcome to New Members of Editorial Board of BCREC Journal** (<https://ejournal2.undip.ac.id/index.php/bcrec/announcement/view/134>)

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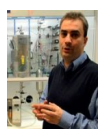


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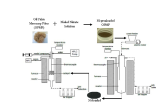
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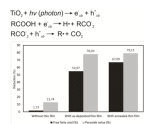
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Gasification of Nickel-Preloaded Oil Palm Biomass with Air

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Abstract

This study experimentally investigates the gasification of nickel-preloaded oil palm biomass as an alternative catalytic approach to produce clean syngas. To eliminate the use of catalyst support, nickel was added directly to the oil palm mesocarp fiber via ion-exchange using an aqueous solution of nickel nitrate. Nickel species was found to disperse very well on the biomass at a nano-scale dispersion. The presence of the finely dispersed nickels on biomass enhanced syngas production and reduced tar content in the producer gas during the air gasification of biomass. It is believed that nickel particles attached on the biomass and its char promote the catalytic cracking of tar on their surface and supply free radicals to the gas phase to enhance the radical-driven gas-phase reactions for the reforming of high molecular weight hydrocarbons. The unconsumed nickel-containing char shows great potential to be re-utilised as a catalyst to further enhance the destruction of tar components in the secondary tar reduction process. Copyright © 2016 BCREC GROUP. All rights reserved

Keywords: gasification; biomass; oil palm mesocarp fiber; nickel; tar

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1. Introduction

Gasification is an attractive technology for exploiting the abundantly available biomass materials as the renewable sources of energy and fuels. The presence of incompletely reformed volatiles (tar) in the producer gas, however, causes several problems to the biomass gasification systems. Tar which is a complex compound, consisting a mixture of hundreds of heavy organic constituents including aliphatic and aromatic hydrocarbons as well as oxygenates, does not only lower the heating value of

fuel gas but may also condense at various process stages to cause clogging, fouling, corrosion, loss of efficiency and unscheduled plant shut-down.

Physical gas clean up (e.g. filtration and scrubbing) can be used to remove tar. However, this strategy requires gas cooling that result in the wastage of large amount of heat. In addition, considerable amount of wastewater is also produced, necessitating an additional treatment in the process system which in turn leads to increased capital and operating costs. Thermal process of tar reforming, on the other hand, requires an operation at a highly elevated temperature (above 1100 °C) for effective tar destruction.

Catalytic process appears as a promising alternative to the physical and thermal processes

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Research Article

Ultrasonically Promoted Synthesis of Ethyl 2-(naphthalen-2-yloxy)acetate in Solid-Liquid Heterogeneous Phase Transfer Catalysis Condition

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Abstract

In this paper, the synthesis of ethyl 2-(naphthalen-2-yloxy)acetate from β -naphthol and ethyl 2-bromoacetate under ultrasound and catalyzed by quaternary ammonium salt in solid-liquid heterogeneous condition was described. Trace amount of water play a major role in this solid-liquid reaction. The reaction follows pseudo first order rate law. The apparent rate constant of the organic phase reaction was obtained from the experimental data. The combination of small amount of tetrabutylammonium bromide (TBAB) and ultrasound ($k_{app} = 25.22 \times 10^{-3} \text{ min}^{-1}$) shows several fold enhanced rate of the reaction than the conventional operation ($k_{app} = 6.42 \times 10^{-3} \text{ min}^{-1}$ for TBAB only). The rate constant increases (0.05 to 0.3 g) with increase in the concentration of catalyst (from $k_{app} = 10.12 \times 10^{-3} \text{ min}^{-1}$ to $k_{app} = 34.46 \times 10^{-3} \text{ min}^{-1}$). The other kinetic effects such as, effect of agitation speed, kind of frequency of ultrasound, kind of various quantity of K_2CO_3 , quantity of water, temperature, different quaternary ammonium salts, solvents and volume of organic solvents on the conversion of ethyl 2-bromoacetate and apparent rate constant were investigated in detail and rational explanations are provided. Copyright © 2016 BCREC GROUP. All rights reserved

Keywords: phase-transfer catalyst; solid-liquid mode; ethyl 2-bromoacetate; ethyl 2-(naphthalen-2-yloxy)acetate; ultrasonication

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1. Introduction

Phase-transfer catalysis (PTC) [1-3] is an effective technique for conducting heterogeneous reactions where the reagents are located in different phases [4]. In order to reaction take place, the pinch of phase-transfer catalyst was added to the reaction system. The phase-

transfer agent must forming active catalyst with the reactant anion from the aqueous or solid phase and transports it through the interfacial region into the organic phase [5] for an ion-pair extraction of normal phase-transfer catalysis. Undoubtedly, PTC offers many substantial advantages for the practical execution of numerous reactions [6]. PTC technology is now used in the manufacture of an extremely wide variety of chemicals such as polymers, petrochemicals, pharmaceuticals, agrochemicals and other commodities, specialty and fine

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