LEMBAR

HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*

KARYA ILMIAH : JURNAL ILMIAH*

Judul Jurnal Ilmiah (Artikel)	: Optimization of monoglycerides production using KF/CaO-MgO Heterogeneous Catalysis	
Nama Penulis	: Luqman Buchori*, Didi Dwi Anggoro, **Indro Sumantri**, Riko Rikardo Putra	
Jumlah Penulis	: 4 orang	
Status Pengusul	: **Penulis ketiga**	
Identitas Jurnal Ilmiah	: a. Nama Jurnal	: Bulletin of Chemical Reaction Engineering & Catalysis
	b. Nomor ISSN	: 1978-2993
	c. Volume, Nomor, Bulan, Tahun	: Vol. 14, No. 3, 2019, pp. 689-696
	d. Penerbit	: Teknik Kimia, Universitas Diponegoro
	e. DOI artikel (jika ada)	: https://doi.org/10.9767/bcrec.14.3.4251.689-696
	f. Alamat web Jurnal	: https://ejournal2.undip.ac.id/index.php/bcrec/issue/view/427
	Alamat web Artikel	: https://ejournal2.undip.ac.id/index.php/bcrec/article/view/4251
	g. Terindeks di Scimagojr/Thomson Reuter (Q3)	

Kategori Publikasi Jurnal Ilmiah : (beri ✓pada kategori yang tepat)

√	Jurnal Ilmiah Internasional / Internasional bereputasi
	Jurnal Ilmiah Nasional Terakreditasi
	Jurnal Ilmiah Nasional terindeks di DOAJ, IPI, SINTA

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer 1	Reviewer 2	
a. Kelengkapan unsur isi artikel (10%)	4,0	4,0	4,0
b. Ruang lingkup dan kedalaman pembahasan (30%)	10,0	10,0	10,0
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d. Kelengkapan unsur dan terbitan/jurnal (30%)	11,0	12,0	11,5
Total = (100%)	**35,5**	**37**	**36,25**
Nilai Pengusul = (0,4 x 36,25)/3 = 4,83			

Semarang, 28 Januari 2022

Reviewer 1

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Prof. Nita Aryanti, ST, MT, Ph D.
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a. Kelengkapan unsur isi artikel (10%)	4,0		4,0
b. Ruang lingkup dan kedalaman pembahasan (30%)	12,0		10,0
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12,0		10,5
d. Kelengkapan unsur dan terbitan/jurnal (30%)	12,0		11,0
Total = (100%)	**40,00**		**35,5**
Nilai Pengusul	**(0,4 x 35,5)/3 = 4,73**		

Catatan Penilaian Artikel oleh Reviewer:

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Bulletin of Chemical Reaction Engineering & Catalysis (BCREC) dengan penerbit Universitas Diponegoro adalah Jurnal Internasional Bereputasi terindek Scopus dengan ISSN: 1978-2993. Kualitas terbitan baik dengan SJR 0,31 (2020) dan termasuk Q3.Jurnal Reaktor adalah jurnal yang terakreditasi, sehingga kualitas terbitannya baik. Jurnal ini juga terindek di DOAJ. → (nilai = 27,5%).

Semarang, 14 Januari 2022
Reviewer 1

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Bidang Ilmu : Teknik Kimia

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	g. Terindeks di Scimagojr/Thomson Reuter (Q3)	
Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat)	: [√] Jurnal Ilmiah Internasional / Internasional bereputasi	
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Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah		Nilai Akhir Yang Diperoleh
	Internasional Bereputasi [40]	Nasional Terakreditasi [ ]	
a. Kelengkapan unsur isi artikel (10%)	4,0		4
b. Ruang lingkup dan kedalaman pembahasan (30%)	12,0		10
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12,0		11
d. Kelengkapan unsur dan terbitan/jurnal (30%)	12,0		12
Total = (100%)	**40,00**		**37**
Nilai Pengusul	**(0,4 x 37)/3 = 4,93**		

Catatan Penilaian Artikel oleh Reviewer:

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Artikel tentang proses optimasi pada pembuatan Mono gliserida denga katalis heterogen. Sebanyak 30,43% dari daftar pustaka digunakan dalam pembahasan. → (nilai = 25 %).

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Semarang,
Reviewer 2

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Optimization of monoglycerides production using KF/CaO-MgO heterogeneous catalysis

Buchori, Luqman ; Anggoro, Didi Dwi; Sumantri, Indro; Putra, Riko Rikardo

Save all to author list

[a] Department of Chemical Engineering, Faculty of Engineering, Diponegoro University, Jl. Prof. Soedarto, SH, Tembalang, Semarang, 50275, Indonesia

Abstract

The production of monoglyceride or monoacylglycerol (MAG) from triglycerides and glycerol has been studied. The purpose of this research was to study the effect of using KF/CaO-MgO catalyst on MAG production with batch reactor. The effect of reaction temperature, reaction time, and catalyst loading was investigated using Response Surface Methods (RSM). The reaction temperature, reaction time, and catalyst loading were varied at 200-220 °C, 2-4 hours, and 0.1-0.3 % w/w, respectively. The maximum yield of monoglyceride 41.58% was achieved the optimum conditions of catalyst loading of 0.19 % (w/w), reaction temperature of 208.37 °C, and reaction time of 3.20 hours. Copyright © 2019 BCREC Group. All rights reserved.

Author keywords

KF/Ca-MgO Catalyst; Monoglyceride; Optimization; Response Surface Method

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Research Article

Optimization of Monoglycerides Production Using KF/CaO-MgO Heterogeneous Catalysis

Luqman Buchori*, Didi Dwi Anggoro, Indro Sumantri, Riko Rikardo Putra

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Received: 25th January 2019; Revised: 28th May 2019; Accepted: 29th May 2019;
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Abstract

The production of monoglyceride or monoacylglycerol (MAG) from triglycerides and glycerol has been studied. The purpose of this research was to study the effect of using KF/CaO-MgO catalyst on MAG production with batch reactor. The effect of reaction temperature, reaction time, and catalyst loading was investigated using Response Surface Methods (RSM). The reaction temperature, reaction time, and catalyst loading were varied at 200-220 ºC, 2-4 hours, and 0.1-0.3 % w/w, respectively. The maximum yield of monoglyceride 41.58% was achieved the optimum conditions of catalyst loading of 0.19 % (w/w), reaction temperature of 208.37 ºC, and reaction time of 3.20 hours.

Keywords: KF/Ca-MgO Catalyst; Monoglyceride; Optimization; Response Surface Method

How to Cite: Buchori, L., Anggoro, D.D., Sumantri, I., Putra, R.R. (2019). Optimization of Monoglycerides Production Using KF/CaO-MgO Heterogeneous Catalysis. *Bulletin of Chemical Reaction Engineering & Catalysis*, 14(3): 689-696 (doi:10.9767/bcrec.14.3.4251.689-696)

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1. Introduction

Cooking oil is made from vegetable oils that has been purified and used in the food industry as well as for daily needs. Most of the fat in food (including cooking oil) has formed of triglycerides, which is broken down, triglycerides will turn into one glycerol molecule and three free fatty acid molecules. The more triglycerides that break down causes more free fatty acids to be produced [1,2]. Monoacylglycerol (MAG) / monoglyceride is a chemical oleo compound that is widely used in the food, pharmaceutical, cosmetics, detergent [3,4], oil well drilling [5], textiles [6], packaging [7], plastic processing [7], and construction material [8]. Triglycerides are widely converted to monoglycerides and diglycerides, because these two product are very widely used in food processing.

Monoglycerides can be prepared by glycolysis reactions between fat and fatty acid methyl esters of palm oil. The glycolysis reactions can be carried out by biocatalyst (enzymatic glycolysis/enzymatic reactions), without catalyst (non-catalyst reaction), or by chemical catalyst (chemical glycolysis). The most common method is the catalysis reaction using alkaline catalysts such as NaOH [9], $NaOCH_3$ [10], MgO [11,12] and CaO [13]. However, the use of this alkaline catalyst has a low catalyst activity. The activity of the catalyst can be increased by dispersing a metal oxide on the surface of another metal oxide [14] (such as: CaO on the surface of MgO). Mixed metal oxides (CaO-MgO) provide stronger basic strength than pure oxide (CaO or MgO) [15]. Mixed metal oxides will also increase the surface area of the catalyst [14]. The use of im-

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Bulletin of Chemical Reaction Engineering & Catalysis, 14 (3) 2019, 478-489

Research Article

Pd-Fe_3O_4/RGO: a Highly Active and Magnetically Recyclable Catalyst for Suzuki Cross Coupling Reaction using a Microfluidic Flow Reactor

Hany A. Elazab[1*], Ali R. Siamaki[2], B. Frank Gupton[2,3], M. Samy El-Shall[2,3]

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Abstract

There are several crucial issues that need to be addressed in the field of applied catalysis. These issues are not only related to harmful environmental impact but also include process safety concerns, mass and heat transfer limitations, selectivity, high pressure, optimizing reaction conditions, scale-up issues, reproducibility, process reliability, and catalyst deactivation and recovery. Many of these issues could be solved by adopting the concept of micro-reaction technology and flow chemistry in the applied catalysis field. A microwave assisted reduction technique has been used to prepare well dispersed, highly active Pd/Fe_3O_4 nanoparticles supported on reduced graphene oxide nanosheets (Pd-Fe_3O_4/RGO), which act as a unique catalyst for Suzuki cross coupling reactions due to the uniform dispersion of palladium nanoparticles throughout the surface of the magnetite - RGO support. The Pd-Fe_3O_4/RGO nanoparticles have been shown to exhibit extremely high catalytic activity for Suzuki cross coupling reactions under both batch and continuous reaction conditions. This paper reported a reliable method for Suzuki cross-coupling reaction of 4-bromobenzaldehyde using magnetically recyclable Pd/Fe_3O_4 nanoparticles supported on RGO nanosheets in a microfluidic-based high throughput flow reactor. Organic synthesis can be performed under high pressure and temperature by using a stainless steel micro tubular flow reactor under continuous flow reaction conditions. Optimizing the reaction conditions was performed via changing several parameters including temperature, pressure, and flow rate. Generally, a scalable flow technique by optimizing the reaction parameters under high-temperature and continuous reaction conditions could be successfully developed.

Keywords: Suzuki cross-coupling; 4-bromobenzaldehyde; Pd-Fe_3O_4/RGO; Flow reactor

How to Cite: Elazab, H.A., Siamaki, A.R., Gupton, B.F., El-Shall, M.S. (2019). Pd-Fe_3O_4/RGO: a Highly Active and Magnetically Recyclable Catalyst for Suzuki Cross Coupling Reaction using a Microfluidic Flow Reactor. *Bulletin of Chemical Reaction Engineering & Catalysis*, 14(3): 478-489 (doi:10.9767/bcrec.14.3.3518.478-489)

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1. Introduction

Over the past few decades, micro-reaction technology has been emerged as an ideal route to solve several critical issues in many aspects including organic chemistry and applied catalysis [1-8]. This new technology has created new promising horizons for chemical synthesis and industry via performing chemistry under continuous flow reaction conditions instead of the conventional batch chemistry [9-16]. This

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Bulletin of Chemical Reaction Engineering & Catalysis, 14 (3) 2019, 551-558

Research Article

Isatin Aldazines Synthesis using A Proton Exchanged Algerian Montmorillonite Clay as Acid Eco-friendly Catalyst

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Abstract

An efficient and easy procedure is developed for the synthesis of isatin aldazines or bis-Schiff bases of isatin, catalyzed by a proton exchanged Algerian montmorillonite clay (MMT-H^+) as green catalyst. The products were obtained in two catalyzed steps under conventional heating in ethanol. Isatin-3-hydrazone obtained from the reaction of isatin with hydrazine monohydrate reacts in the second step with the appropriate aromatic aldehydes to give the desired products in good yields. The main advantages of using this protonated solid non-toxic catalyst in this synthesis are its availability and low cost, the simplicity of its use, the recycling possibilities without significant loss of its catalytic activity and its environmentally benign process.

Keywords: Montmorillonite-H^+; Isatine; Isatin-3-hydrazone; bis-Schiff bases; Isatin Aldazines; Green catalyst

How to Cite: Benlahreche, B., Taleb, A., Lahrech, M.B., Hacini, S. (2019). Isatin Aldazines Synthesis using A Proton Exchanged Algerian Montmorillonite Clay as Acid Eco-friendly Catalyst. *Bulletin of Chemical Reaction Engineering & Catalysis*, 14(3): 551-558 (doi:10.9767/bcrec.14.3.4574.551-558)

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1. Introduction

Isatin (1H-indole-2,3-dione) and its derivatives possess a broad variety of biological and pharmacological properties [1]. Isatin widely used as starting materials for the synthesis of a broad range of various heterocyclic compounds, including indole, oxoindoles and quinoline [2]. Bis-Schiff bases of isatin also called azines [3] of isatin (Figure 1) are reported to indicate an assortment of biological activities, such as antibacterial [4], antifungal [5], anticancer [6], antiviral [7], antiproliferative [8], anti-inflammatory [9], antiglycation [10], antitubercular [11], antioxidant [12,13], anticonvulsant [14], anti-HIV [15,16], cytotoxicity [17], analgesic [18], CNS, depressant [19] and also considered as corrosion inhibitors [20].

Synthesis of isatin-based azines are generally made by condensation of 3-hydrazinoindolin-2-one with aldehydes or ketones to yield respectively isatin aldazines (R_1 or R_2 = H) or isatin ketazines (R_1 and $R_2 \neq$ H) [21]. Most of these synthesis are based mainly on traditional thermal methods in presence of organic solvents and a range of catalysts, such as: acetic acid [22], HCl [23], triethyl amine [24], $FeCl_3.6H_2O$ [25],

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