LEMBAR

HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*

KARYA ILMIAH : JURNAL ILMIAH*

Judul Jurnal Ilmiah (Artikel)	: Inhibitory Effect of Sodium Benzoate as Preservative Material in the Biogas Production in a Batch Anaerobic Digestion Process	
Nama Penulis	: **Indro Sumantri**, Luqman Buchori, Didi Dwi Anggoro	
Jumlah Penulis	: 3 orang	
Status Pengusul	: **Penulis Pertama dan Penulis Korespondensi**	
Identitas Jurnal Ilmiah	: a. Nama Jurnal	: Journal of Ecological Engineering
	b. Nomor ISSN	: 2299-8993
	c. Volume, Nomor, Bulan, Tahun	: Vol. 21, Issue 8, November 2020
	d. Penerbit	: Polskie Towarzystwo Inzynierii Ekologicznej
	e. DOI artikel (jika ada)	: http://www.jeeng.net/Inhibitory-effect-of-Sodium-Benzoate-as-Preservative-Material-in-the-Biogas-production,127005,0,2.html
	f. Alamat web Jurnal	: http://www.jeeng.net/Issue-8-2020,8481
	g. Terindeks di Scimagojr/Web of Science (**Q2**)	

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

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	Reviewer 1	Reviewer 2	
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b. Ruang lingkup dan kedalaman pembahasan (30%)	11,00	10,8	10,90
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d. Kelengkapan unsur dan terbitan/jurnal (30%)	11,00	11,0	11,00
Total = (100%)	**37,00**	**36,9**	**36,95**
Nilai Pengusul = (0,6 x 36,95) = 22,17			

Semarang,

Reviewer 1

Prof. Dr. Ir. Bakti Jos, DEA
NIP. 196005011986031003
(Bidang Ilmu/Unit Kerja: Teknik Kimia/Universitas Diponegoro)

Reviewer 2

Prof. Dr. Ir. Abdullah, MS
NIP. 195512311983031014
(Bidang Ilmu/Unit Kerja: Teknik Kimia/Universitas Diponegoro)

LEMBAR
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Identitas Jurnal Ilmiah	:	a. Nama Jurnal	: Journal of Ecological Engineering
		b. Nomor ISSN	: 2299-8993
		c. Volume, nomor, bulan, tahun	: Volume 21, No. 8, August 2020, pp. 120-128
		d. Penerbit	: Polish Society of Ecological Engineering (PTIE)
		e. DOI artikel (jika ada)	: https://doi.org/10.12911/22998993/127005
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		Alamat URL Artikel	: http://www.jeeng.net/Inhibitory-effect-of-Sodium-Benzoate-as-Preservative-Material-in-the-Biogas-Production,127005,0,2.html
		g. Terindeks	: SCOPUS (Q3), SJR (2020) = 0,31

Kategori Publikasi Jurnal Ilmiah : [√] Jurnal Ilmiah Internasional Bereputasi
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c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	12			11,00
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Nilai Pengusul = (40% x 37,00)/2 = 7,40				

Catatan penilaian artikel oleh Reviewer :

1. **Kesesuaian dan kelengkapan unsur isi jurnal:** Penulisan artikel sesuai dengan Author Guidelines. Artikel ditulis secara lengkap terdiri dari Title, Introduction, Material and Methods, Results and Discussion, Conclusion, Acknowledgement, dan References. Artikel ditulis sesuai bidang ilmu pengusul/penulis yaitu Teknik Kimia.
2. **Ruang lingkup dan kedalaman pembahasan:** Artikel ini berisi tentang pengaruh sodium benzoate sebagai bahan pengawet pada produksi biogas. Proses dilakukan di dalam reactor batch. Isi artikel masih di dalam ruang lingkup jurnal. Hasil penelitian disajikan dengan baik dan dibahas cukup mendalam. Pembahasan melibatkan 15 pustaka yang relevan dan mutakhir.
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:** Metodologi dituliskan dengan urut dan jelas. Data-data disajikan dalam bentuk tabel dan grafik sehingga cukup jelas. Artikel ini didukung dengan referensi sebanyak 32 dan sebagian besar berupa jurnal. Sebanyak 23 referensi merupakan referensi yang mutakhir karena kurang dari 10 tahun. Sebanyak 13 referensi berumur kurang dari 5 tahun.
4. **Kelengkapan unsur dan kualitas terbitan:** Artikel diterbitkan pada Jurnal Internasional Bereputasi yaitu Journal of Ecological Engineering. Junal ini sudah terindeks SCOPUS dengan SJR = 0,31, kategori Q3 dan h-index = 19.

Semarang,
Reviewer 1

Prof. Dr. Ir. Bakti Jos, DEA
NIP. 196005011986031003
(Bidang Ilmu/Unit kerja : Teknik Kimia/Universitas Diponegoro)

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		g. Terindeks	: SCOPUS (Q3), SJR (2020) = 0,31

Kategori Publikasi Jurnal Ilmiah : [√] Jurnal Ilmiah Internasional Bereputasi
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c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	12			11,1
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11,0
Total = 100%	**40**			**36,9**
Nilai Pengusul = (40% x 36,9)/2 = 7,38				

Catatan penilaian artikel oleh Reviewer :

1. **Kesesuaian dan kelengkapan unsur isi jurnal:** Artikel ditulis secara lengkap dengan isi Title, Introduction, Material and Methods, Results and Discussion, Conclusion, Acknowledgement, dan References. Artikel ditulis sesuai bidangnya yaitu Teknik Kimia.
2. **Ruang lingkup dan kedalaman pembahasan:** Artikel berisi pengaruh sodium benzoate sebagai bahan pengawet pada produksi biogas di dalam reactor batch anaerobik. Pembahasan yang dilakukan cukup dalam. Terdapat 32 referensi, 15 diantaranya untuk pembahasan hasil.
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:** Data pendukung cukup banyak begitu juga acuannya banyak dan mutakhir. Jumlah Pustaka ada 32 dan tiga belas citasi (13) diantaranya yang digunakan adalah baru (5 tahun terakhir).
4. **Kelengkapan unsur dan kualitas terbitan:** Merupakan jurnal ilmiah internasional bereputasi yang sudah terindeks Scopus dan memiliki faktor dampak (SJR=0,31; 2020). Kualitas penerbit bagus dan masuk katagori Q3.

Semarang,
Reviewer 2

Prof. Dr. Ir. Abdullah, MS
NIP. 195512311983031014
(Bidang Ilmu/Unit kerja : Teknik Kimia/Universitas Diponegoro)

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Inhibitory Effect of Sodium Benzoate as Preservative Material in the Biogas Production in a Batch Anaerobic Digestion Process

Sumantri, Indro ✉ ; Buchori, Luqman; Anggoro, Didi Dwi

Save all to author list

[a] Department of Chemical Engineering, Faculty of Engineering, Universitas Diponegoro, Semarang, Indonesia

Abstract

Sodium benzoate has been used a food preservative worldwide. The effect of sodium benzoate as a preservative in the wastewater treatment was examined from the biogas formation viewpoint. The research was conducted in batch mode reactor systems employing various ratios of activated sludge and solution of sodium benzoate volume. The MLSS of activated sludge used was 12 g/L, while the volume ratios of activated sludge and sodium benzoate ranged from 0 to 100%. The concentrations of sodium benzoate used were 50, 100, and 200 mg/L. The biogas samples were measured every two days for 60 days. The results showed that the volume ratio of activated sludge and sodium benzoate of 60% and 40% was a turning point where the existence of sodium benzoate influenced the formation of biogas. There were significant reductions of biogas formation from 200.6 mL to 66.6 mL, 159.8 mL to 66.0 mL and 130.2 mL to 54.0 mL for the initial SB concentrations of 50, 100, and 200 mg/L. The kinetic pa-rameters of the Modified Gompertz equation exhibited the greatest degree of confidence equal to 95%.

Author keywords

anaerobic; batch; biogas; Gompertz equation; sodium benzoate

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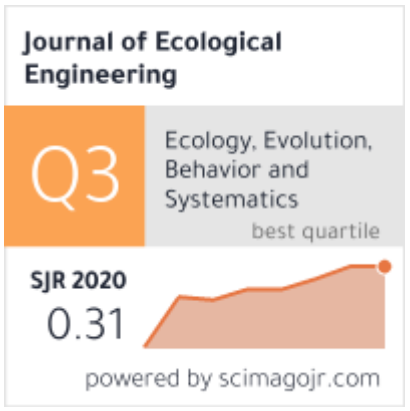

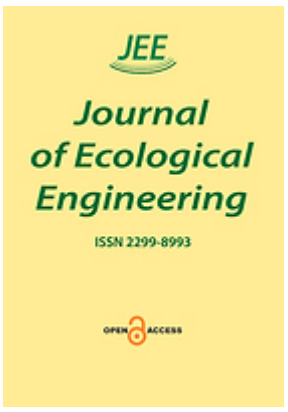

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Abstract Article (PDF)

Inhibitory effect of Sodium Benzoate as Preservative Material in the Biogas Production in a Batch Anaerobic Digestion Process

Indro Sumantri, Luqman Buchori, Didi Dwi Anggoro

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Inhibitory Effect of Sodium Benzoate as Preservative Material in the Biogas Production in a Batch Anaerobic Digestion Process

Indro Sumantri[1*], Luqman Buchori[1], Didi Dwi Anggoro[1]

[1] Department of Chemical Engineering, Faculty of Engineering, Universitas Diponegoro, Semarang, Indonesia
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ABSTRACT
Sodium benzoate has been used a food preservative worldwide. The effect of sodium benzoate as a preservative in the wastewater treatment was examined from the biogas formation viewpoint. The research was conducted in batch mode reactor systems employing various ratios of activated sludge and solution of sodium benzoate volume. The MLSS of activated sludge used was 12 g/L, while the volume ratios of activated sludge and sodium benzoate ranged from 0 to 100%. The concentrations of sodium benzoate used were 50, 100, and 200 mg/L. The biogas samples were measured every two days for 60 days. The results showed that the volume ratio of activated sludge and sodium benzoate of 60% and 40% was a turning point where the existence of sodium benzoate influenced the formation of biogas. There were significant reductions of biogas formation from 200.6 mL to 66.6 mL, 159.8 mL to 66.0 mL and 130.2 mL to 54.0 mL for the initial SB concentrations of 50, 100, and 200 mg/L. The kinetic parameters of the Modified Gompertz equation exhibited the greatest degree of confidence equal to 95%.

Keywords: sodium benzoate, anaerobic, biogas, batch, Gompertz equation.

INTRODUCTION

Fresh product consumption has been increased in order to meet the consumer's demand of the healthy food. Unfortunately, the freshness and safety of fresh food product is strongly influenced by their microbial sensitivity to pathogenic bacteria (Chen et al., 2019). The effort to prevent food from deterioration can be conducted through several technologies, one of the ways is by the addition of food preservatives. The objective of the introduction of preservative substances is not only to eliminate the microbial activities to damage the food nutrients, but also to extend the life period of the food (Arias et al., 2019). Basically, the preservative agents inhibit the yeast and mold growth. The most commonly applied preservative agents in the food products are benzoic and sorbic acids and their salts of sodium, potassium and calcium (Piper and Piper, 2017). These preservatives are effective against the growth of a wide range of bacteria (Tfouni and Toledo, 2002a). Beside these substances, another group applied as a preservative agent of food product and also pharmaceuticals are parabens. Parabens are substances of *p*-hydroxybenzoic acid, with alkyl substituents ranging from methyl to pentyl or benzyl groups. The application of parabens as a preservative is popular because they are effective in inhibiting the activity of a wide broad spectrum of yeasts, molds and bacteria, chemical stability, having low production cost and no perceptible odor or taste (Błędzka et al., 2014). However, a disadvantage of using these chemical substances as preservative has been reported, at low doses. Benzoates trigger allergic reaction in some groups of humans (Jacob et al., 2016). Due to these disadvantages, the amount of benzoates and sorbates addition salts as simple preservatives which consumed by world population must be considered to prevent the adverse effects (Piper and Piper, 2017).

Sodium benzoate (SB) is widely used in food products, especially as complement food/seasoning such as: chili sauce, ketchup, tomato sauce, carbonated drinks, etc. (Sumantri et al., 2015)

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Effect of Surfactant Properties on the Performance of Forward Osmosis Membrane Process

Kaiwit Ruengruehan[1], Seoktae Kang[2], Nirawan Sanphoti[3], Sutha Khaodhiar[1*]

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ABSTRACT

Wastewater treatments such as forward osmosis (FO) can be widely applied to separate or the reject substances from secondary treated effluents. Experimental studies have investigated the influence of membrane fouling and operating conditions. The performance of FO is affected by membrane fouling characteristics, composition of the feed solution and operating conditions. The experiments were performed using an osmotic membrane (FO-4040) to investigate the influences of operating conditions on water flux and reverse salt selectivity. The surfactant content, cross-flow velocity, and pH of the feed solution were systematically investigated for their effects on FO performance. The results showed that higher cross-flow velocities, increase of the pH of the feed solution, and adding surfactant into the feed solution yielded higher water fluxes. Reverse salt selectivity also increased after adding a surfactant to the feed solution but showed no significant increase at higher surfactant concentrations.

Keywords: omotically-membrane process; anionic surfactant; nonionic surfactant

INTRODUCTION

Forward osmotic (FO) membrane processes utilize the differences in solution concentration to generate an osmotic pressure gradient as the driving force. Diffusion in water molecules continually occurs across a semipermeable membrane from a less concentrated feed solution to a highly concentrated draw solution (She et al., 2012). The semipermeable membrane allows the water molecules and a small amount of salt to pass through, while most solute molecules and particulates are rejected (Mi et al., 2008). The advantages of the forward osmosis membrane process are that it can be used at low or zero hydraulic pressure, with high rejection in a wide range of pollutants. Forward osmosis can also be widely applied in many fields, such as water treatment, wastewater treatment, water reuse, brackish groundwater and seawater desalination (Mi et al., 2008; Cath et al., 2006; Yuan et al., 2010). As with other separation processes, many factors hinder the performance of forward osmosis, including solution properties, membrane properties, concentration polarization, and especially membrane fouling (Cath et al., 2006; Klaysom et al., 2013). Municipal wastewater contains a variety of organic and inorganic substances, and particulates from domestic sources include some toxic elements (Lutchmiah et al., 2014). Several studies found that the accumulation and interactions between the properties of the membrane and the properties of the foulant are the main causes of flux decline (Lee et al., 2005). Membrane fouling occurs due to the accumulation of colloidal particles on the osmotic membrane that generate cake enhanced osmotic pressure (CEOP) close to the membrane surface, resulting in flux decline in the forward osmosis process (Boo et al.,2012; Zhao et al., 2012; Valladares et al., 2011).

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Comparative Performance of Physicochemical and Diatom-Based Metrics in Assessing the Water Quality of Mert Stream, Turkey

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ABSTRACT
In this study, the authors aimed to compare the performance of the physicochemical-based water quality metrics (WQI, SWQMR) and diatom-based diatom metrics (TDI, BDI, GDI) to evaluate the water quality and ecological status of the Mert Stream. A total of 104 epilithic diatom species, belonging to 44 genera, were recorded during the study period. *Navicula* was the most dominant diatom in the sites near intensive farming areas, while *Gomphonema* was the most dominant species in the sites in vicinity of urban and industrial settlements. According to the water quality indices based on the physicochemical parameters and diatoms, the water quality in the upper and middle parts of the Mert stream was better than in the lower parts (higher amount of total suspended solids and higher conductivity). The structure of the epilithic diatom community was mostly shaped by total suspended solids, electrical conductivity and nutrients according to Canonical Correspondence Analysis results. The obtained results revealed that diatom metrics, especially GDI, and water quality metrics, especially WQI, can be used for the monitoring of lotic systems and provide useful complementary information on the ecological status of rivers in medium rainfall regions such as Samsun.

Keywords: diatom index; water quality index; epilithic; pollution; stream; CCA

INTRODUCTION

Anthropogenic eutrophication becomes a serious problem, which threatens the freshwater ecosystem worldwide due to the enrichment of water nutrients resulting from the industrial and intensive agricultural activities and leads to the deterioration of the water quality of rivers and lakes [Vörösmarty et al. 2010]. The bioindicator-based indices provide a valuable complement to the traditional physicochemical measurement-based indices to evaluate the ecological health of aquatic systems [Pandey et al. 2018].

The Water Quality Index (WQI) is an important tool for determining and categorizing water quality based on the use of physicochemical standard parameters [Hanh et al. 2011]. The WQI provides a single number ranges from 0 to 100 which show better water quality with higher index values. WQI turns complex water quality data, which consist of several numbers of parameters, into the information that is understandable and usable in the management of water [Chaurasia et al. 2018]. However, the indices using only physical and chemical parameters may not convey the information on the impacts of environmental stresses on organisms. Several different organisms such as phytoplankton, macrophytes, macro-invertebrates, are also used for representing the whole picture of the biological health of lotic ecosystems [Chen et al. 2016].

The diatom indices are extensively used to assess the ecological status of rivers because of the ubiquitous presence of diatoms in lotic systems