LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH C2

Judul Publikasi Ilmiah (Artikel)		:	Synthesis of A Novel Carrier Compound Thiazoethyl Methyl Eugenoxyacetate from Eugenol and Its Use in the Bulk Liquid Membrane Technique
Jumlah Penulis		:	5 orang
Status Pengusul		:	penulis pertama/utama
Identitas Jurnal Ilmiah	a. Nama Jurnal Ilmiah:		Indonesian Journal of Chemistry
	b. Nomor ISBN /ISSN		: 2042-4876
	c. Volume, Nomor, Bulan, Tahun		Volume18 (1) februari 2018
	d. Penerbit		Departemen Kimia FMIPA UGM
	e. DOI artikel (jika ada)		https://doi.org/10.22146/ijc.25075
	f. Alamat web jurnal		https://jurnal.ugm.ac.id/ijc/article/view/25075
	g. Terindeks di SCOPUS (category : Q3), Scimago journal Rank (powered by SCOPUS), : SciFinder - Powered by Chemical Abstract Services (CAS), ESCI - Emerging Sources Citation Index - Powered by Web of Science, DOAJ - Directory of Open Access Journal, ROAD - the Directory of Open Access scholarly Resources, Google Scholar, CrossRef, JournalTOCs - scholarly journal Tables of Contents (TOCs), BASE - Bielefeld Academic Search Engine, SINTA (Category : Sinta1=-1), Indonesian Publication Index (IPI), Indonesia One Search, Indonesian Scientific Journal Database (ISJD)		
	e. Jumlah Halaman		6 (121-126)

Kategori Publikasi Jurnal Ilmiah :
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☐ Jurnal Ilmiah Nasional Terakreditasi
☐ Jurnal Ilmiah Nasional/Nasional Terindeks di DOAJ, CABI, COPERNICUS**

Hasil Penilaian *Peer Review*

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir yang diperoleh
	Internasional Bereputasi Berimpack faktor	Nasional Terakreditasi	Nasional	
	(40)			
a. Kelengkapan unsur isi jurnal (10%)	4			3,5
b. Ruang lingkup dan kedalaman pembahasan (30%)	12			10,0
c. Kecukupan dan kemutahiran data/ informasi dan metodologi (30%)	12			9,5
d. Kelengkapan unsur dan kualitas penerbit (30%)	12			11,0
Total = (100 %)	40			34,0
Nilai Pengusul =				

Catatan Penilaian artikel oleh Reviewer :

. 1. **Kesesuaian dan kelengkapan unsur isi jurnal:**	:	Isi dari juurnal meliputi Abstract, Introduction, Experimental, Results and Discussion, Conclusions serta Reference. Artikel yang ditulis sudah meliputi akan hal tersebut. Ada perunbahan penulisan daftar pustaka dimana judul sudah dituliskan (skor= 3,5).
. 2. **Ruang lingkup dan kedalaman pembahasan:**	:	Fokus dan Scope dari jurnal adalah chemistry, including educational chemistry, applied chemistry, and chemical engineering. Artikel tentang material membran dan uji dalam proses adsorpsi logam berat. Tema ini masih termasuk dalam chemistry dan chemical engineering. Pembahasan sebagian masih berbentuk diskripsi sebagaian sudah membahas secara mendalam dan menyajikan pembanding, bahkan yang seharusnya masuk Procedure ada juga di dalam diskusi. (skor= 10,0).
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi**	:	Literatur yang digunakan terbaru adalah tahun 2016 dimana tentang proses adsorpsi logam berat juga dari penulis yang bersangkutan. Untuk poly eugenol masih berasala dari penulis sendiri dari jurnal nasional dan internasional dari Ybs. Metodoolgi banyak dari penelitian Ybs

		sebelumnhya(skor= 9,5).
4. **Kelengkapan unsur dan kualitas terbitan:**	:	Penerbit adalah Dep Kimia Fak MIPA UGM, Editor Internasional dari 8 negara. Kualitas terbitan secara online dan cetak dan sudah terindeks di scopus (Q3 untuk tahun 2016 dan 2017 dan Q4 untuk tahun 2013-2015) (skor= 11,0).

Semarang, 4/12 18
Reviewer 1

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Prof. Dr. Widayat, MT
NIP. 19720906 199803 1001

Nilai

Rata-rata Peer Review= 20,25

Nilai PAK Universitas = 20,25

Ttd. Penilai PAK Universitas

Prof. Dr. Hadiyanto, ST, MSc

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KARYA ILMIAH : JURNAL ILMIAH C2

Judul Publikasi Ilmiah (Artikel)	:	Synthesis of A Novel Carrier Compound Thiazoethyl Methyl Eugenoxyacetate from Eugenol and Its Use in the Bulk Liquid Membrane Technique
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	b. Nomor ISBN /ISSN	: 2042-4876
	c. Volume, Nomor, Bulan, Tahun	Volume18 (1) Februari 2018
	d. Penerbit	Departemen Kimia FMIPA UGM
	e. DOI artikel (jika ada)	https://doi.org/10.22146/ijc.25075
	f. Alamat web jurnal	https://jurnal.ugm.ac.id/ijc/article/view/25075
	g. Terindeks di SCOPUS (category : Q3), Scimago journal Rank (powered by SCOPUS), : SciFinder - Powered by Chemical Abstract Services (CAS), ESCI - Emerging Sources Citation Index - Powered by Web of Science, DOAJ - Directory of Open Access Journal, ROAD - the Directory of Open Access scholarly Resources, Google Scholar, CrossRef, JournalTOC's - scholarly journal Tables of Contents (TOCs), BASE - Bielefeld Academic Search Engine, SINTA (Category : Sinta1=-1), Indonesian Publication Index (IPI), Indonesia One Search, Indonesian Scientific Journal Database (ISJD)	
	h. Jumlah Halaman	6 (121-126)

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	Internasional Bereputasi Berimpack faktor	Nasional Terakreditasi	Nasional	
	(40)			
a. Kelengkapan unsur isi artikel (10%)	4			3,5
b. Ruang lingkup dan kedalaman pembahasan (30%)	12			9,5
c. Kecukupan dan kemutahiran data/ informasi dan metodologi (30%)	12			9,5
d. Kelengkapan unsur dan kualitas penerbit (30%)	12			10
Total = (100 %)	40			33,5
Nilai Pengusul =				

Catatan Penilaian artikel oleh Reviewer :

1. **Kesesuaian dan kelengkapan unsur isi jurnal:**	:	Isi dari artikel meliputi title, abstract & abstrak berbahasa Indonesia, introduction, experimental section, results and discussion, conclusion, dan References. Kurang ada kesesuaian antara judul dengan abstrak dan kesimpulan (skor = 3,5).
2. **Ruang lingkup dan kedalaman pembahasan:**	:	Artikel ini menyajikan hasil penelitian mengenai sintesis membrane TMEAA dan diterapkan dlm proses pemisahan logam mberat Cu (2+), Cd (2+) dan Cr (3+) sehingga masih dalam lingkup jurnal (kimia, pendidikan kimia, teknik kimia dan kiia terapan. Tidak dijelaskan tujuan penulisannya sehinga tidak bisa diambil kesimpulan yang tepat. Hasil penelitian dibahas kurang mendalam walaupun didukung dg pustaka yang baik. Tetapi terdapat kecenderungan untuk hanya mengulangi hal-hal yang muncul di prosedur percobaan (skor = 9,5).
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi**	:	Pustaka yang digunakan pada umumnya sudah tua/lebih dari 10 tahun (ada 9 dari 22 pustaka). Pustaka yang digunakan dalam pembahasan kurang dari 50%. Bahkan pada metodologi justru tidak mendasarkan pada pustaka (skor= 9).
4. **Kelengkapan unsur dan kualitas terbitan:**	:	Jurnal *Indones. J. Chem.* tergolong dalam Q3 Scopus dan h -indeks 7 ketika artikel ini terbit. Penggunaan Bahasa Inggris dlm jurnal ini kurang begitu baik. Jurnal diterbitkan oleh Departemen Kimia FMIP UGM dengan Editor berasal dari 8 negara. Penulis didominasi dari Indonesia (20 artikel dari 25 artikel). Terdapat 15-20 artikel untuk sekali terbitan. Judul dan gambar pada Figure 2 saling berhimpitan. (skor= 10).

Semarang,
Reviewer 2

Prof. Dr. Andri Cahyo Kumoro, ST, MT.

Bidang ilmu/Unit kerja :Teknik Kimia/ Universitas Diponegoro

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Indonesian Journal of Chemistry Open Access
Volume 18, Issue 1, 2018, Pages 121-126

Synthesis of a novel carrier compound thiazoethyl methyl eugenoxyacetate from eugenol and its use in the bulk liquid membrane technique (Article)

(Open Access)

Djunaidi, M.C. ✉, Wibawa, P.J., Murti, R.H.

Save all to author list

Department of Chemistry, Faculty of Science and Mathematics, Diponegoro University, Jl. Prof. H. Soedarto, S.H., Tembalang, Semarang, 50275, Indonesia

Abstract

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Research into the synthesis and use of a novel carrier compound, thiazoethyl methyl eugenoxyacetic acid (TMEAA) for selective transport of Cu(II), Cd(II) and Cr(III) metal ions in the bulk liquid membrane (BLM) technique was conducted. TMEAA was synthesized from eugenol by acidification into eugenoxyacetic acid and subsequently esterified using 4-methyl-5-thiazoethanol. Analysis of the result was performed using GC-MS and FTIR. The TMEAA obtained was liquid, viscous, blackish-brown and fragrant, with a yield of 88%. This compound was soluble in benzene and chloroform but insoluble in methanol. The GC-MS analysis showed the presence of a single peak, with a retention time of 26.5 min, while the disappearance of vibration mode at 1727 cm^{-1} was attributed to acid absorption and the FTIR spectrum indicated that formation of an ester group had occurred. TMEAA was used as a carrier compound in the BLM technique to transport Cu(II), Cd(II) and Cr(III), using chloroform as a solvent. The results showed that TMEAA was more selective for Cu(II) and Cd(II) than Cr(III). Moreover, the research proved that N and S groups of TMEAA were selective for Cu (II) and Cd (II).

SciVal Topic Prominence

Topic: Liquid membranes | Extraction | Membrane ELM

Prominence percentile: 95.306

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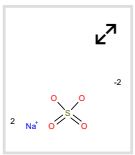
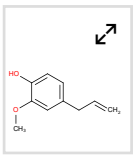
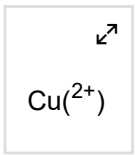

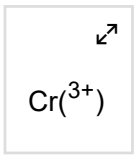

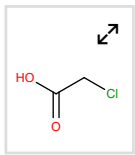

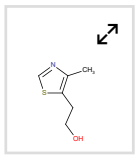

Author keywords

Bulk Liquid Membrane (BLM) | Eugenol | Selective transport | Thiazoethyl methyl eugenoxyacetic acid

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Djunaidi, M.C. , Wenten, I.G.
(2019) IOP Conference Series: Materials Science and Engineering

Synthesis of polyeugenoxy acetyl thiophene methanolate as a new selective carrier
Djunaidi, M.C. , Lusiana, R.A. , Pardoyo
(2019) IOP Conference Series: Materials Science and Engineering

Synthesis and characterization of co-edaf and its application test as a carrier membrane for phenol transport using polymer inclusion membrane (PIM)
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1 Misra, B.M., Gill, J.S.
Supported Liquid Membranes in Metal Separations
(1996) *ACS Symposium Series*, 642, pp. 361-375. Cited 12 times.
View at Publisher

2 Ramkumar, J., Chandramouleeswaran, S.
A Perceptive on Bulk Liquid Membrane: A Brief Review, Indian
(2015) *J. Adv. Chem. Sci.*, 3 (4), pp. 293-298. Cited 6 times.

3 Peterson, R.T., Lamb, J.D.
Design of Macrocyclic Carriers for Liquid Membranes
(1996) *ACS Symposium Series*, 642, pp. 129-141. Cited 4 times.

4 Nezhadali, A., Moeinpour, F.
Comparative metal ion extraction of Ag(I), Cu(II), Ni(II), Zn(II), Mn(II), Cd(II) and Co(II) cations using dibenzo 18C6 as a carrier (Open Access)
(2013) *Alexandria Engineering Journal*, 52 (1), pp. 123-127. Cited 4 times.
http://www.elsevier.com.proxy.undip.ac.id:2048/wps/find/journaldescription.cws_home/724292/description#description
doi: 10.1016/j.aej.2012.11.006
View at Publisher

5 Kazemi, S.Y., Shamsipur, M.
Selective transport of lead(II) through a bulk liquid membrane using a cooperative carrier composed of benzylaza-12-crown-4 and oleic acid (Open Access)
(2005) *Bulletin of the Korean Chemical Society*, 26 (6), pp. 930-934. Cited 15 times.
http://newjournal.kcsnet.or.kr/
doi: 10.5012/bkcs.2005.26.6.930
View at Publisher

6 Kazemi, S.Y., Hamidi, A.S.
Competitive removal of lead(II), copper(II), and cadmium(II) ions through a bulk liquid membrane containing macrocyclic crown ethers and oleic acid as ion carriers
(2011) *Journal of Chemical and Engineering Data*, 56 (2), pp. 222-229. Cited 16 times.
doi: 10.1021/je1007108
View at Publisher

7 Eljaddi, T., Hor, M., Benjjar, A., Riri, M., Mouadli, H., Mountassir, Y., Hlaibi, M.
New supported liquid membrane for studying facilitated transport of U(VI) ions using Tributyl Phosphate (TBP) and Tri-n-Octylamine (TOA) as carriers from acid medium
(2015) *BAOJ Chem.*, 1 (1), pp. 1-9. Cited 4 times.

8 Bartsch, R.A., Way, J.D.
Chemical Separations with Liquid Membranes: An Overview
(1996) *ACS Symposium Series*, 642, pp. X-10. Cited 71 times.

9 Djunaidi, M.C., Jumina, Siswanta, D., Ulbricht, M.
Synthesis of fe ionic-imprinted polyeugenol using polyethylene glycol diglycidilether as cross-linking agent for sorption of fe(III)

(2015) *Indonesian Journal of Chemistry*, 15 (3), pp. 305-314. Cited 14 times.
http://pdm-mipa.ugm.ac.id/ojs/index.php/ijc/article/download/1003/1131

View at Publisher

10 Djunaidi, M.C., Jumina, Siswantaanta, D., Ulbricht, M.
Synthesis of ionic imprinted polymer particles for selective membrane transport of Fe(III) using polyeugenol as the functional polymer (Open Access)

(2016) *Oriental Journal of Chemistry*, 32 (1), pp. 77-84. Cited 6 times.
http://www.orientjchem.org/download/14958
doi: 10.13005/ojc/320107

View at Publisher

11 Djunaidi, M.C., Jumina, Siswanta, D., Ulbricht, M.
Selective transport of Fe(III) using polyeugenol as functional polymer with ionic imprinted polymer membrane method (Open Access)

(2015) *Asian Journal of Chemistry*, 27 (12), pp. 4553-4562. Cited 13 times.
http://www.asianjournalofchemistry.co.in/Journal/ViewArticle.aspx?ArticleID=27_12_44
doi: 10.14233/ajchem.2015.19228

View at Publisher

12 Djunaidi, M.C., Jumina, S.D., Ulbricht, M.
(2016) *Selective Transport of Fe(Ii) Using Ionic Imprinted Polymer (IIP) Membrane Particle*, 1699 (1).

13 Cahyono, H., Djunaidi, M.C.
Synthesis of pyridine methyl eugenoxy acetate and selectivity study of Cu(II) in Bulk Liquid Membrane (BLM) transport
(2008) *Proc. Nat. Conf. Chem. Educ.*
Sebelas Maret University, Surakarta, Indonesia

14 Djunaidi, M.C., Lusiana, R.A., Wibawa, P.J., Siswanta, D.
Sintesis polyeugenol sebagai ekstraktan selektif logam krom(III)
(2007) *Alchemy*, 6, pp. 40-49. Cited 7 times.

15 Lindoy, L.F., Baldwin, D.S.
Ligand Design for Selective Metal-Ion Transport Through Liquid Membranes

(1989) *Pure and Applied Chemistry*, 61 (5), pp. 909-914. Cited 66 times.
doi: 10.1351/pac198961050909

View at Publisher

16 Cleij, M.C., Scrimin, P., Tecilla, P., Tonellato, U.
Efficient and Highly Selective Copper(II) Transport across a Bulk Liquid Chloroform Membrane Mediated by Lipophilic Dipeptides

(1997) *Journal of Organic Chemistry*, 62 (16), pp. 5592-5599. Cited 21 times.
http://pubs.acs.org/joc
doi: 10.1021/jo9703257

View at Publisher

17 Brinchi, L., Germani, R., Mancini, M.V., Savelli, G., Spreti, N.
Carrier-mediated transport of toxic heavy metal ions in bulk liquid membranes

(2004) *European Journal of Organic Chemistry*, (6), pp. 1330-1335. Cited 16 times.
doi: 10.1002/ejoc.200300622

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18 Djunaidi, M.C., Lusiana, R.A., Wibawa, P.J., Siswanta, D.
Sintesis turunan polieugenol sebagai carrier bagi recovery logam berat dengan teknik membran cair
(2010) *Reaktor*, 13 (1), pp. 16-23. Cited 5 times.

19 Djunaidi, M.C., Trisna, D.
Sintesis asam eugenoksi asetat (EOA) dari eugenol untuk ekstraktan logam berat dan recovery krom dari limbah elektroplating
(2010) *Jurnal Kimia Sains Dan Aplikasi*, 13 (1), pp. 12-17. Cited 3 times.

20 Hancock, R.D., Martell, A.E.
Ligand Design for Selective Complexation of Metal Ions in Aqueous Solution

(1989) *Chemical Reviews*, 89 (8), pp. 1875-1914. Cited 1049 times.
doi: 10.1021/cr00098a011

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21 Djunaidi, M.C., Khabibi, Ulumudin, I.
Separation of Cu^{2+}, Cd^{2+} and Cr^{3+} in a Mixture Solution Using a Novel Carrier Poly(Methyl Thiazoleethyl Eugenoxy Acetate) with BLM (Bulk Liquid Membrane) (Open Access)

(2017) *IOP Conference Series: Materials Science and Engineering*, 172 (1), art. no. 012032. Cited 4 times.
http://www.iop.org/EJ/journal/mse
doi: 10.1088/1757-899X/172/1/012032

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22 Ulewicz, M., Lesinska, U., Bochenska, M., Walkowiak, W.
Facilitated transport of Zn(II), Cd(II) and Pb(II) ions through polymer inclusion membranes with calix[4]-crown-6 derivatives

(2007) *Separation and Purification Technology*, 54 (3), pp. 299-305. Cited 68 times.
doi: 10.1016/j.seppur.2006.09.018

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Indonesian Journal of Chemistry

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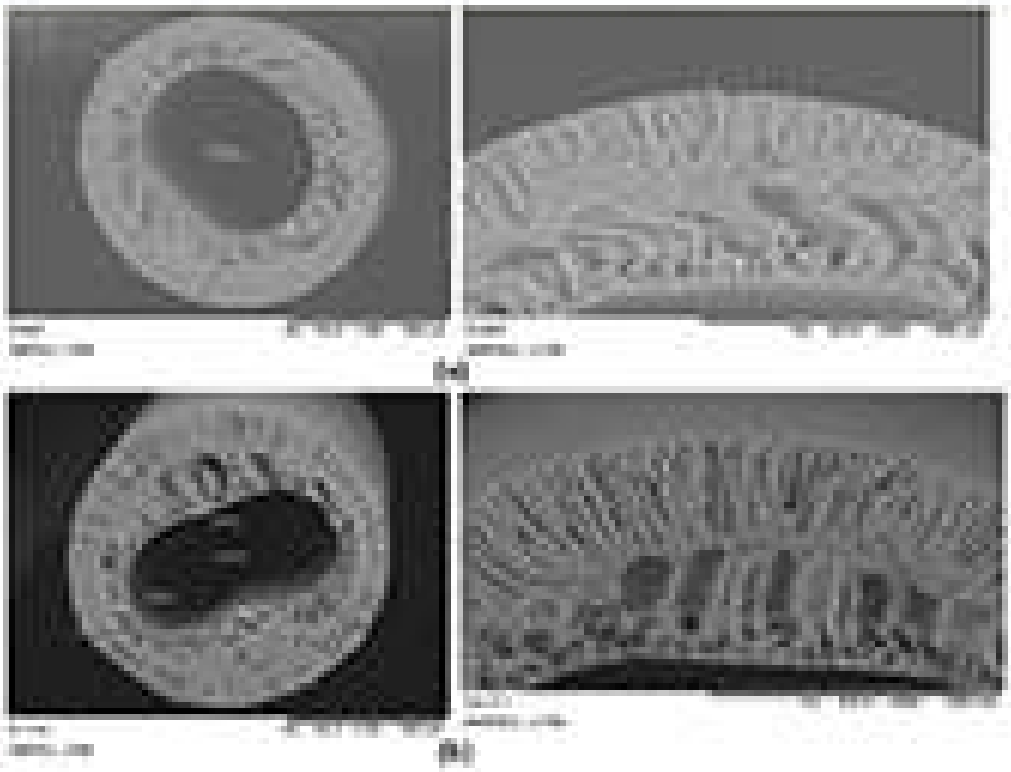

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Indonesian Journal of Chemisty (ISSN 1411-9420 / 2460-1578) - Chemistry Department, Universitas Gadjah Mada, Indonesia.

One-Pot Eco-Safe Saccharin-Catalyzed Procedure for Expedient and Convenient Synthesis of Dihydropyrano[2,3-*c*]pyrazole, Tetrahydrobenzo[*b*]pyran and Pyrano[2,3-*d*]pyrimidinone Scaffolds as a Green and Versatile Catalyst

Farzaneh Mohamadpour[1], Mojtaba Lashkari[2,*], and Nourallah Hazeri[1]

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ABSTRACT

A green and facile saccharin-catalyzed procedure is developed for the one-pot convenient synthesis of dihydropyrano[2,3-c]pyrazole, tetrahydrobenzo[b]pyran and pyrano[2,3-d]pyrimidinone scaffolds via multi-component tandem Knoevenagel cyclocondensation reaction. This procedure has the chief advantages of green, inexpensive and readily available catalyst, high atom-economy, high to quantitative yields and the reaction procedure is mild and involves facile workup procedure to obtain the desired products in short reaction times.

Keywords: *green procedures; saccharin; dihydropyrano[2,3-c]pyrazoles; tetrahydrobenzo[b]pyrans; pyrano[2,3-d]pyrimidinones*

ABSTRAK

Metode sintesis yang mudah dan green, yakni sintesis one-pot terkatalisis sakarin, telah dikembangkan untuk menghasilkan kerangka dihydropyrano[2,3-c]pyrazole, tetrahydrobenzo[b]pyran and pyrano[2,3-d]pyrimidinone melalui reaksi multikomponen beruntun yang terdiri dari reaksi Knoevenagel dan siklokondensasi. Metode ini memiliki kelebihan yaitu bersifat green, tidak mahal, katalis mudah didapat, dan atom ekonomi yang tinggi. Selain itu, reaksi ini dapat dilakukan pada kondisi ringan dan serta memiliki prosedur work-up yang mudah, sehingga berbagai senyawa target dapat dihasilkan dalam waktu reaksi yang singkat dengan rendemen yang tinggi.

Kata Kunci: *metode sintesis green; sakarin; dihydropyrano[2,3-c]pyrazoles; tetrahydrobenzo[b]pyrans; pyrano[2,3-d]pyrimidinones*

INTRODUCTION

Multicomponent reactions (MCRs) are processes ‘‘in which more than two educts directly get converted into their products by one-pot reaction’’ [1-2]. MCRs [3-7] play an important role in modern organic chemistry, because they generally exhibit higher atom economy and selectivity as well as produce fewer by-products compared to classical multistep synthesis [8]. The development of environmentally friendly catalysts and solvents for organic reactions is one of the major minatory factors to environmental and human health. Thus, removal or reduction of the use of non-volatile solvents and non-metallic is one of the major goals of green chemistry.

Structures containing the pyran derivatives have attracted synthetic organic chemists and biochemists because of their pharmaceutical and biological activities. Literature reports have already established pyrans as Chk1 kinase inhibitory activity [9], analgesic properties [10], anticancer [11], vasodilatory activities [12], spamolytic [13] antihypertensive, hepatoprotective, cardiotonic [14], vasodilator [15], anti-leukemic [16-17], emetic [18], anti-anaphylactic activities [19], diuretic [20], anti-alzheimer [21].

Because of the above mentioned applications, many methods using different types of catalysts are reported for the preparation of these compounds which of them ZrO_2 NPs [22], choline chloride/Urea deep [23], isonicotinic [24], molecular sieves [25], meglumine [26], CAPB [27], L-proline/KF-alumina [28], CTACl [29], lipase [30], $CaHPO_4$ [31], SiO_2 NPs [32], Glycerol [33], SBPPSP [34], DBSA [35], $NH_4Al(SO_4)_2•12H_2O$ [36], $NH_4H_2PO_4/Al_2O_3$ [37], ACoPc-MNPs [38], ZnO NPs [39], Fe_3O_4@SiO_2-imid-PMA [40], DABCO-based ionic liquids [41], L-proline [42], Iron ore pellet [43], nano-sawdust-OSO_3H [44], Al-HMS-20 [45], TSA/$B(OH)_3$ [46], Mn/ZrO_2 [47], Green cellulose-based nanocomposite [48],

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An Ellagic Acid Derivative and Its Antioxidant Activity of Chloroform Extract of Stem Bark of *Syzygium polycephalum* Miq. (Myrtaceae)

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ABSTRACT

The investigation of the Syzygium polycephalum *Miq. (Myrtaceae) aimed to assess the phytochemical contents and antioxidant activity of the chloroform fraction. In this study, the fraction was obtained from methanol extract of* S. polycephalum *stem bark partitionated by chloroform. An ellagic acid derivative was successively isolated from the chloroform fraction. The molecular structure of isolated compound was elucidated and established as 3,4,3'-tri-*O*-methylellagic acid through extensive spectroscopic studies including UV-Vis, FTIR, NMR and LC-MS analyses and by comparison with literature data. The finding of the isolated compound is the first time from the plant, although the isolated compound previously have been found in the other* Syzygium *species such as* S. cumini *together with ellagic acid and 3,3'-di-O-methylellagic acid. The chloroform fraction, isolated compound, and vitamin C showed antioxidant activity against 2,2'-diphenyl-1-picrylhydrazyl (DPPH) with* IC_{50} *value of 163.6, 72.1, and 11.5 µg/mL, respectively.*

Keywords: *antioxidant; ellagic acid derivative; Myrtaceae;* Syzygium polycephalum

ABSTRAK

Penelitian pada tumbuhan Syzygium polycephalum *(Myrtaceae) ini bertujuan untuk mengetahui kandungan fitokimia dan sifat antioksidannya dari fraksi kloroform. Dalam penelitian ini, fraksi kloroform diperoleh dari ekstrak metanol kulit batang tumbuhan* S. polycephalum *yang dipartisi oleh pelarut kloroform. Suatu senyawa turunan asam elagat telah berhasil diisolasi dari fraksi kloroform. Struktur senyawa hasil isolasi tersebut dielusidasi melalui kajian spektroskopi (UV-Vis, FTIR, NMR, dan LC-MS) dan juga melalui perbandingan dengan data literatur, dan ditetapkan sebagai asam 3,4,3'-tri-*O*-metilelagat. Penemuan senyawa hasil isolasi ini merupakan pertama kalinya dari tumbuhan tersebut, meskipun sebelumnya senyawa ini juga telah ditemukan pada tumbuhan* Syzygium *lainnya, yakni* S. cumini *bersama dengan asam elagat dan asam 3,3'-di-*O*-metilelagat. Fraksi kloroform, senyawa hasil isolasi, dan vitamin C telah menunjukkan aktivitas antioksidan terhadap 2,2'-diphenyl-1-picrylhydrazyl (DPPH) dengan nilai* IC_{50} *masing-masing adalah 163,6; 72,1; dan 11,5 µg/mL.*

Kata Kunci: *antioksidan; Myrtaceae;* Syzygium polycephalum*; turunan asam elagat*

INTRODUCTION

Syzygium is a genus in the Myrtaceae family that includes a number of popular species cultivated for their many purposes such as colorful, edible and fleshy fruit. The genus name *Syzygium* is derived via Latin from the Greek word 'syzygos', meaning yoked together, possibly referring to the paired leaves [1]. *Syzygium*, the genus of flowering plants, is one of the important genera in Myrtaceae family, mostly distributed in the tropical and sub-tropical region of the world, with the greatest diversity of species taking place in South East Asia such as Indonesia, Malaysia and also in East India. It is represented by around 140 genera and 1100 species [2].

Recent studies focusing on the exploitation of natural compounds from *Syzygium* species for medicinal purposes have drawn much attention to the effective extraction of the desired bioactive ingredients from natural products. On basis of literature study, phytochemical studies on *Syzygium* species have led to the identification and isolation of main compounds such as phenolic compounds (e.g. eugenol, eugenol acetate), and β-caryophyllene found in *S. aromaticum* [3]. The compound had been also found in *S.*

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Physical Mixture Interaction of Acetaminophenol with Naringenin

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ABSTRACT

The interaction of Active Pharmaceutical Ingredient (API) with other compounds will affect drugs stability, toxicity, modified dissolution profiles or may form a new compound with the different crystal structure. Acetaminophenol (APAP), the most common drug used widely (also known as Panadol) was mixed with Naringenin (NR) to glance for a new phase of interactions leading to new compound phase. The amide-acid supramolecular heterosynthon; N-H···O interaction between acid and the respective base were observed in the APAP-NR mixture blends. The interaction was prepared by the binary interaction from neat grinding and liquid-assisted grinding techniques at a different stoichiometry of binary mixture ratio of APAP-NR which were 1:1, 1:2 and 2:1 molar ratio. The interaction was estimated using Group Contribution Method (GCM) and physicochemical properties were characterized by Attenuated Total Reflectance Fourier Transform Infrared (ATR-FTIR), powder X-ray diffraction (PXRD) and Differential Scanning Calorimetry (DSC) analysis. The GCM calculation gave good interaction strength at 212.93 $MPa^{1/2}$. The ATR-FTIR, DSC and PXRD results obtained revealed an interaction with new phase formed.

Keywords: *neat grinding; acetaminophenol; Naringenin; intermolecular interaction*

ABSTRAK

Interaksi Bahan Farmasi Aktif (API) dengan senyawa lain akan mempengaruhi stabilitas obat, toksisitas, mengubah profil disolusi atau dapat membentuk senyawa baru dengan struktur kristal yang berbeda. Asetaminofenol (APAP), obat yang paling umum digunakan secara luas (juga dikenal sebagai Panadol) dicampur dengan Naringenin (NR) untuk mengkaji pembentukan interaksi baru yang mengarah ke pembentukan fasa senyawa baru. Interaksi antara campuran APAP-NR dilihat melalui heterosinton supramolekuler amida-asam N-H···O antara asam dan basa yang sesuai. Interaksi ini disusun oleh interaksi biner dari teknik penggilingan kering dan penggilingan yang dibantu dengan cairan pada stoikiometri rasio biner campuran APAP-NR yang berbeda yaitu rasio molar 1:1, 1:2 dan 2:1. Interaksi diestimasi dengan menggunakan Metode Kontribusi Kelompok (GCM) dan sifat fisikokimia yang karakterisasi melalui Analisis Refleksi Total Fourier Transform Infrared (ATR-FTIR), analisis Difraksi sinar-X (PXRD) dan Diferensial Scanning Calorimetry (DSC). Perhitungan GCM memberikan kekuatan interaksi yang baik pada 212.93 $MPa^{1/2}$. Hasil ATR-FTIR, DSC dan PXRD yang diperoleh menunjukkan adanya interaksi dengan fase baru yang terbentuk.

Kata Kunci: neat grinding*; asetaminofenol; Naringenin; interaksi intermolekuler*

INTRODUCTION

Pharmaceutical products are more commonly known as a fundamental component of both modern and traditional medicine. It is essential to study the interaction of Active Pharmaceutical Ingredients (API) with potential interaction compound present in Naringenin. The interaction may interfere with formulation stability and cause toxicity in the body system. The potentially harmful drug interaction and side effects can be reduced by understanding the route of interaction. Drug interactions can be categorized into drug-drug interaction, drug-food/beverages interaction, and drug-conditions interactions.

Acetaminophenol (APAP) or known as paracetamol is one of the common pharmaceutical products and it is widely used as an antipyretic agent which belongs to a class of drugs known as aniline analgesic to reduce pains. Naringenin (4',5,7-trihydroxyflavanone), is the predominant flavanone as flavonoid glycoside, existing in various plants and is an aglycone of naringin (a flavonoid glycoside, specific to citrus fruits), play roles as an important constituents of human diet which possesses antioxidants, anti-inflammatory, anti-carcinogenic, and anti-tumor effects

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