

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

Judul Karya Ilmiah : Effect of trass substitution in sand on the compressive and flexure strength of concrete
 Jumlah Penulis : 4 orang (**Y A Priastiwi***, Muhrozi, B H Setiadji, and R B K Adi)
 Status Pengusul : Penulis ke-1
 Identitas Prosiding : a. Judul Prosiding : IOP Conf. Series: Earth and Environmental Science
 10th Engineering International Conference
 b. ISBN/ISSN : Online ISSN: 1755-1315; Print ISSN: 1755-1307
 c. Thn Terbit, Tempat Pelaks. : 2022, Semarang, 23 September 2021
 d. Penerbit/Organiser : IOP Publishing
 e. Alamat Repository/Web : <https://iopscience.iop.org/article/10.1088/1755-1315/969/1/012076/meta>
 Alamat Artikel : <https://iopscience.iop.org/article/10.1088/1755-1315/969/1/012076/pdf>
 f. Terindeks di (jika ada) : Scopus

Kategori Publikasi Makalah : ☒ Prosiding Forum Ilmiah Internasional
 (beri ✓ pada kategori yang tepat) ☐ Prosiding Forum Ilmiah Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata /Nilai Akhir yang diperoleh
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi prosiding (10%)	2	3	2.5
b. Ruang lingkup dan kedalaman pembahasan (30%)	6	9	7.5
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	6	8.5	7.25
d. Kelengkapan unsur dan kualitas terbitan /prosiding (30%)	8	9	8.5
Total (100%)	22	29.5	25.75
Nilai Pengusul = 60% x 25.75 = 15.45			

Reviewer I



Prof. Dr. Ir. Windu Partono, M.Sc.
 NIP. 195809291986021001
 Unit Kerja : Departemen Teknik Sipil FT UNDIP

Reviewer II



Prof. Dr. Ir. Han Ay Lie, M.Eng.
 NIP. 195611091985032002
 Unit Kerja : Departemen Teknik Sipil FT UNDIP

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

Judul Karya Ilmiah : Effect of trass substitution in sand on the compressive and flexure strength of concrete
 Jumlah Penulis : 4 orang (Y A Priastiwi*, Muhrozi, B H Setiadji, and R B K Adi)
 Status Pengusul : Penulis ke-I
 Identitas Prosiding : a. Judul Prosiding : IOP Conf. Series: Earth and Environmental Science
 10th Engineering International Conference
 b. ISBN/ISSN : Online ISSN: 1755-1315; Print ISSN: 1755-1307
 c. Thn Terbit, Tempat Pelaks. : 2022, Semarang, 23 September 2021
 d. Penerbit/Organiser : IOP Publishing
 e. Alamat Repository/Web : <https://iopscience.iop.org/article/10.1088/1755-1315/969/1/012076/meta>
 Alamat Artikel : <https://iopscience.iop.org/article/10.1088/1755-1315/969/1/012076/pdf>
 f. Terindeks di (jika ada) : Scopus

Kategori Publikasi Makalah : ☒ Prosiding Forum Ilmiah Internasional
 (beri ✓ pada kategori yang tepat) ☐ Prosiding Forum Ilmiah Nasional

Hasil Penilaian Peer Review :

Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional ☒	Nasional ☐	
a. Kelengkapan unsur isi prosiding (10%)	3.00		2
b. Ruang lingkup dan kedalaman pembahasan (30%)	9.00		6
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9.00		6
d. Kelengkapan unsur dan kualitas terbitan /prosiding (30%)	9.00		8
Total = (100%)	30.00		22
Nilai Pengusul = 60% x 22 = 13.2			

Catatan Penilaian Paper oleh Reviewer :

1. Kesesuaian dan kelengkapan unsur isi prosiding:

Artikel ini menjelaskan tentang hasil penelitian menggunakan material trass sebagai pengganti dari material pasir pada pembuatan beton (concrete). Material trass diambil dari wilayah kabupaten Rembang. Pada artikel ini penulis menyampaikan penggunaan material trass bervariasi sebanyak 0, 20, 40, 50, 60, 80 dan 100% pengganti pasir. Setiap variasi dari campuran, disiapkan tiga sampel benda uji. Setiap variasi campuran dilakukan pengujian tekan pada umur 3, 7, 14, 28 dan 90 hari. Dari hasil penelitian yang disampaikan pada bagian abstract penulis menyampaikan tentang peningkatan kekuatan tekan pada campuran 100% trass seiring dengan peningkatan usia beton. Pada tulisan ini juga disampaikan pada campuran 100% trass diperoleh kekuatan tekan 36% lebih rendah dibandingkan dengan kekuatan beton konvensional menggunakan pasir. Penulis menggunakan istilah trass pada tulisan ini sering rancu dengan istilah traces atau trass yang menyebabkan istilah yang digunakan sering rancu apakah trass itu merupakan istilah dalam Bahasa Inggris. Pada artikel ini penulis sudah menuliskan bagian abstrak, pendahuluan, material dan tahapan penelitian, hasil penelitian dan kesimpulan. Metodologi dari penelitian belum disampaikan secara jelas dan penjelasan dari gambar tidak benar atau tidak sesuai dengan nomor gambarnya sehingga artikel ini terkesan tidak disiapkan dengan baik. Pada bagian tertentu terdapat kalimat yang tidak jelas yang menunjukkan bahwa penulis tidak teliti dalam menyiapkan artikel ini. Hasil penulisan ini juga menunjukkan bahwa ditinjau dari hasil pengujian tekan, penggunaan material trass sebagai pengganti pasir ternyata kurang bermanfaat. Penggunaan material trass ternyata menyebabkan density beton menjadi turun sehingga dari segi material, campuran beton trass mempunyai keuntungan dari segi berat atau density nya.

2. Ruang lingkup dan kedalaman pembahasan:

Penulis telah menyampaikan urutan dari abstrak, pendahuluan, tahapan pengujian dan persiapan material, pembahasan hasil penelitian dan kesimpulan. Pada beberapa gambar penulis tidak menjelaskan secara jelas tentang masing-masing gambar. Pada gambar 12 terdapat perbedaan antara gambar, judul gambar dan penjelasan gambar. Penulis tidak menjelaskan secara lengkap tentang pengertian f_c/f_c sehingga gambar tersebut sulit untuk dipahami. Pada tabel 2 penulis menggunakan istilah traces pada penjelasan tetapi pada isi tabel menggunakan istilah trass. Pada tulisan ini metodologi penelitian tidak disampaikan secara jelas. Kesimpulan yang dituliskan pada artikel ini tidak sama dengan abstrak. Pada pengujian lentur penulis menyampaikan umur sampel balok 7 dan 28 hari tetapi pada penjelasan terdapat tulisan yang kurang jelas apakah 7 hari atau 14 hari. Terlihat penulis kurang teliti pada saat menyampaikan hasil penelitian. Secara umum pada penjelasan atau uraian yang disampaikan pada artikel ini banyak dijumpai ketidak lengkapan atau ketidak jelasan dari tulisan.

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

Data untuk penelitian sudah disiapkan dengan baik. Hasil penelitian ini menunjukkan penggunaan trass sebagai bahan pengganti pasir ternyata kurang bermanfaat ditinjau dari segi kekuatan tekannya dan kekuatan lenturnya. Pada pengujian lentur penelitian ini hanya meninjau kekuatan lentur untuk sampel balok yang berumur 14 dan 28 hari. Penulis tidak menyampaikan bagaimana korelasi kekuatan lentur pada umur 14 dan 28 hari. Pada pengujian lentur karena terdapat beberapa informasi tentang umur sampel beton 7, 14 dan 28 hari maka grafik yang disiapkan untuk penjelasan hasil pengujian lentur yang hanya 7 dan 28 hari menyebabkan hasil penelitian ini khususnya pengujian lentur balok sedikit kurang jelas. Metodologi penelitian belum disampaikan secara jelas karena adanya ketidak jelasan pengujian lentur sampel balok.

4. Kelengkapan unsur dan kualitas terbitan:

Penulis menerbitkan artikelnya pada Proceeding International "IOP Conf. Series: Earth and Environmental Science", yang terindeks pada Scopus dengan nilai SJR 0.2. Artikel ini sudah diterbitkan pada proceeding yang baik. Pada tulisan ini, penulis melakukan sitasi pada 19 artikel ilmiah atau code international. Sembilan artikel ilmiah diantaranya diterbitkan pada kurun waktu kurang dari 10 tahun. Pada kesimpulan penulis terlihat ragu-ragu pada saat menuliskan hasil penelitiannya karena sebagian besar dari hasil penelitian ternyata atau terlihat mempunyai kekuatan tekan maupun kekuatan lentur lebih kecil dari

beton konvensional atau tanpa campuran trass. Penulis tidak memberikan alasan atau mencoba memberikan hipotesa tentang penyebab dari kegagalan model campuran material trass sebagai pengganti material pasir pada beton.

Semarang, 10 April 2023

Reviewer 1



Prof. Dr. Ir. Windu Partono, M.Sc.

NIP. 195809291986021001

Unit Kerja : Departemen Teknik Sipil FT UNDIP

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

Judul Karya Ilmiah : Effect of trass substitution in sand on the compressive and flexure strength of concrete
 Jumlah Penulis : 4 orang (Y A Priastiwi*, Muhrozi, B H Setiadji, and R B K Adi)
 Status Pengusul : Penulis ke-1
 Identitas Prosiding : a. Judul Prosiding : IOP Conf. Series: Earth and Environmental Science
 10th Engineering International Conference
 b. ISBN/ISSN : Online ISSN: 1755-1315; Print ISSN: 1755-1307
 c. Thn Terbit, Tempat Pelaks. : 2022, Semarang, 23 September 2021
 d. Penerbit/Organiser : IOP Publishing
 e. Alamat Repository/Web : <https://iopscience.iop.org/article/10.1088/1755-1315/969/1/012076/meta>
 Alamat Artikel : <https://iopscience.iop.org/article/10.1088/1755-1315/969/1/012076/pdf>
 f. Terindeks di (jika ada) : Scopus

Kategori Publikasi Makalah : ☒ Prosiding Forum Ilmiah Internasional
 (beri ✓ pada kategori yang tepat) ☐ Prosiding Forum Ilmiah Nasional

Hasil Penilaian Peer Review :

Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional 30	Nasional ☐	
a. Kelengkapan unsur isi prosiding (10%)	3.00		3.00
b. Ruang lingkup dan kedalaman pembahasan (30%)	9.00		9.00
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9.00		8.50
d. Kelengkapan unsur dan kualitas terbitan /prosiding (30%)	9.00		9.00
Total = (100%)	30.00		29.5
Nilai Pengusul = 60% x 29.5 = 17.70			

Catatan Penilaian Paper oleh Reviewer :

1. Kesesuaian dan kelengkapan unsur isi prosiding:

Kesesuaian dan kelengkapan isi jurnal terpenuhi dengan adanya bagian abstrak, pendahuluan yang memuat tujuan penelitian, metode pengerjaan, hasil dan observasi serta referensi berupa daftar pustaka. Paper termuat dalam prosiding internasional terindeks scopus dengan SJR 0,202. Kelengkapan unsur untuk prosiding sudah lengkap, ada sertifikat bentuk penyajian maupun penyelenggaraan seminar pendukungnya. Hasil similarity juga memenuhi ketentuan persyaratan yaitu hanya 3% < 15%

2. Ruang lingkup dan kedalaman pembahasan:

Paper ini mengenai adanya substitusi suatu material berupa trass dalam pasir dengan parameter kekuatan tekan dan lentur. Tahapan yang dilakukan dalam penulisan mulai dari latar belakang, tujuan, metode serta hasil dan pembahasan sudah ditunjukkan dengan lengkap dan detail. Hasil penelitian sudah dapat ditunjukkan dengan adanya grafik dan tabel yang mudah untuk dipahami. Hasil pengujian telah dilakukan analisis dan pembahasan dengan cukup baik, serta telah dikaitkan dengan penelitian orang lain

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

Kecukupan dan kemutakhiran data informasi perlu lebih ditingkatkan dengan mengacu atau melihat paper/jurnal terkait dan kurangi referensi hanya dari code-code pengujian walaupun memang digunakan sebagai referensi

4. Kelengkapan unsur dan kualitas terbitan:

Kelengkapan unsur dan kualitas dari terbitan sudah sesuai dengan persyaratan, yang dibuktikan dengan terindeks scopus untuk prosiding internasionalnya dan mudah dilacak secara online, IOP Conf. Series: Earth and Environmental Science 969 (2022) 012076

Semarang,
 Reviewer 2

Prof. Dr. Ir. Han Ay Lie, M.Eng
 NIP. 195611091985032002
 Unit Kerja : Departemen Teknik Sipil FT UNDIP



CERTIFICATE OF PARTICIPATION

Awarded to

YULITA ARNI PRIASTIWI

As

Presenter

Paper Title

**EFFECT OF TRASS SUBSTITUTION IN SAND ON THE COMPRESSIVE AND FLEXURE
STRENGTH OF CONCRETE**

The 10th Engineering International Conference 2021

Semarang, Indonesia, September 23rd 2021

Dean of Engineering Faculty
Universitas Negeri Semarang



Dr. Nur Qudus, M.T., IPM.

The 10th EIC Chairman



Dr. Prima Astuti Handayani, S. T., M. T.

[Back to results](#) | 1 of 1[Download](#) [Print](#) [Save to PDF](#) [Save to list](#) [More...](#)

IOP Conference Series: Earth and Environmental Science • Open Access • Volume 969, Issue 1 • 7 February 2022 • Article number 012076 • 10th Engineering International Conference, EIC 2021 • Semarang, Virtual • 23 September 2021 • Code 177104

Document type

Conference Paper • Gold Open Access

Source type

Conference Proceedings

ISSN

17551307

DOI

10.1088/1755-1315/969/1/012076

[View more](#)

Effect of trass substitution in sand on the compressive and flexure strength of concrete

[Priastwi Y.A.](#) [✉](#); [Muhrozi](#); [Setiadji B.H.](#); [Adi R.B.K.](#)[Save all to author list](#)^a Department of Civil Engineering, Universitas Diponegoro, Indonesia

20

Views count [?](#)[View all metrics](#)[Full text options](#) [Export](#)**Abstract**

SciVal Topics

Metrics

Abstract

The existence of limitations in the supply of sand as a concrete material requires an alternative. On the other hand, the potential trass in Rembang is quite abundant and has not been utilized optimally. This study utilizes the potential of trass ex. Rembang is a substitution of sand in concrete with compressive and flexural strength as test parameters. Concrete with a design quality of 33 MPa is made from the split, cement, water, and sand substituted with trass 0,20,40,50,60,80, and 100% of the weight of sand in cylinders 15/30 cm and beams 15x15x60 cm. The concrete was treated with wet burlap and tested at the 3, 7, 14, 28, and 90 days in compression also 7 and 28 days in flexure. The test results show that the presence of trass in the concrete reduces the concrete compressive strength by 17% until 42% of the concrete compressive strength without trass. Moreover, the flexural strength decreases by 7% to 23%. Concrete using a fine aggregate in the form of trass (100% trass) has increased compressive strength with increasing age of the concrete, but with a compressive strength of 36% lower than the compressive strength of concrete with sand as the fine aggregate. © Published under licence by IOP Publishing Ltd.

Cited by 0 documents

Inform me when this document is cited in Scopus:

[Set citation alert](#)**Related documents**

Effect of four iranian natural pozzolans on concrete durability against chloride penetration and sulfate attack

Ramezaniapour, A.A. , Mirvalad, S.S. , Aramun, E. (2010) *2nd International Conference on Sustainable Construction Materials and Technologies*

Conversion of low cost mineral material to Pozzolana and its impact on cement parameters and cost of production

Gul, S. , Saeed, F. , Amin, N.U.. (2014) *Chemical Engineering Transactions*

Impact of rice husk on concrete: A review

Saha, P. , Saini, G. , Kumar, P. (2020) *Journal of Critical Reviews*

[View all related documents based on references](#)

[Find more related documents in Scopus based on:](#)

[Authors](#)



Source details

IOP Conference Series: Earth and Environmental Science

Scopus coverage years: from 2010 to Present

ISSN: 1755-1307 E-ISSN: 1755-1315

Subject area: Earth and Planetary Sciences: General Earth and Planetary Sciences
Environmental Science: General Environmental Science

Source type: Conference Proceeding

[View all documents >](#)

[Set document alert](#)

[Save to source list](#)

[Source Homepage](#)

CiteScore 2021

0.6

SJR 2021

0.202

SNIP 2021

0.409

CiteScore

CiteScore rank & trend

Scopus content coverage

Improved CiteScore methodology

CiteScore 2021 counts the citations received in 2018-2021 to articles, reviews, conference papers, book chapters and data papers published in 2018-2021, and divides this by the number of publications published in 2018-2021. [Learn more >](#)

CiteScore

2021

0.6

=

45,063 Citations 2018 - 2021

74,324 Documents 2018 - 2021

Calculated on 05 May, 2022

CiteScoreTracker 2022

0.8

=

60,727 Citations to date

75,404 Documents to date

Last updated on 05 March, 2023 • Updated monthly

CiteScore rank 2021

Category	Rank	Percentile
Earth and Planetary Sciences	#153/191	20th
General Earth and Planetary Sciences		
Environmental Science	#191/228	16th
General Environmental Science		

[View CiteScore methodology >](#)

[CiteScore FAQ >](#)

[Add CiteScore to your site](#)



**Kampus
Merdeka**
INDONESIA JAYA

EIC
Engineering International
Committee

THE **10TH** ENGINEERING
INTERNATIONAL
CONFERENCE

THE **10TH** ENGINEERING INTERNATIONAL CONFERENCE

**Exploring The Innovation of Green-advanced Research in
Applied Sciences, Engineering, and Technologies**

CONFERENCE E-BOOKLET

● **Faculty of Engineering
Universitas Negeri Semarang
2021**

TABLE OF CONTENTS

TABLE OF CONTENTS	2
WELCOMING SPEECH	8
TECHNICAL COMMITTEE	9
SCIENTIFIC COMMITTEE	10
STUDENT STAFF	12
CONFERENCE SCHEDULE	13
PARALLEL SESSION SCHEDULE	14
KEYNOTE SPEAKERS PROFILE	27
Hiroshi Enomoto (Ph. D. in Engineering)	27
Dr. Shu-Shun Liu	28
Dr. Junaidah Jai	29
Prof. Dr. Wara Dyah Pita Rengga, S.T., M.T.	30
KEYNOTE SPEECH SUMMARY	31
Hydrogen Effect on the Ignition Timing of Reciprocated Engine for Bio-Syngas Usage	31
Preventive Maintenance Model for National School Buildings in Indonesia Using a Constraint Programming Approach	32
Essential Oil in Bioplastic Film for Food Packaging	33
Activated Carbon-Based Slow Release Fertilizer for Crop Production	34
ABSTRACT COMPILATION	35
Mechanical Properties Characterization of Ti6Al4V for Artificial Hip Joint Materials Prepared by Investment Casting	36
Production of Biogas Using AnF2B Reactor from Cassava Starch Wastewater with Consortium Bacteria as Biocatalyst	37
Siwalan Peel (Borassus Flabellifer) as an Alternative Bio-Adsorbent for Removing Heavy Metal Ions (Fe and Cr) in Industrial Waste	38
Utilization of HVS Paper Waste with Collage Art and Paper Quilling Techniques as a 2-Dimensional Medium for Hair Styling Learning Beauty Management Program	39
Engineering the Waste of Beverage Cans as the Innovation of Balinese Bride Accessories in the New Normal Era	40
Physicochemical and Photodegradation Characteristics of Hematite-Biochar Nanocomposite Prepared from Bamboo Sawdust	41
The Service Improvement of the Regional Water Company (PDAM) at Surakarta City	42
Challenges and Possibilities of Implementing Sustainable Palm Oil Industry in Indonesia	43

The Relationship of Traders Activities to the Quality of City Park (Case Study: Taman Sampangan Semarang).....	133
Green Campus Development of UNNES Postgraduate Program: Potential Identification and Performance Analysis	134
The Mitigation of Covid-19 in the Perspective of Contractor for Sustainable Construction in Indonesia	135
The Bibliometric Analysis of Green Operations Research.....	136
The Spatial Phenomenon of Kin's Settlements in the UNNES Campus Area: Study of Activities and the Meaning of Spaces.....	138
The Dynamics of the Factory Function as a Production Room at the House of Clothing Artisans in Pekalongan.....	139
Effect of Trass Substitution in Sand on the Compressive and Flexure Strength of Concrete	140
Youth Social Behavior in Using the City's Public Space (Case Study of Menteng Bintaro Park)	141
Exhaust Gas Pressure and Flow Velocity Analysis of the Conical Silencer High Performance Low Noise Exhaust Muffler.....	142
Modelling Student Travel Mode Choice: A Case Study in Semarang, Indonesia	143
Comparison of Retrofit Failure to Pull Out Single Anchor of Plain Steel and Deformed Cast Inplace and Post Installed Chemical Epoxy Methods	144
Comparison Analysis of Unstandardized Roundabout Between MKJI 1997 And USHCM 2000 by Simulation Model	145
Study of the Application of the Green Construction Concept on the Integrated College Building Project of Teuku Umar University	146
The Development of Permeable Pavement from Demolished Construction Waste...	147
The Interrelation of the Colonial Legacy as the Historical Context for Structural Transformation in Central Java and Yogyakarta	148
Building Design Recommendation for Thermal Comfort in Cities on the Island of Java, Indonesia.....	149
Redesign Gajah Mungkur Park in Semarang City as Public Space and Green Open Space with Using the Concept "Hidden Layer of Semarang"	150
Behavior Analysis of Building Column Structure with Retaining Wall Due to Explosion Load in Front and Side a Construction.....	151
Transportation Modelling Using PTV Vissim for Adjacent Junction in Sampangan Semarang City	152
Organic Inhibitors from Rice Husks as Corrosion Rate Inhibitors and Strong Press Enhancers on Reinforced Concrete Construction	153

WELCOMING SPEECH

Dear colleagues,

Praises all to Allah for His blessing and mercy that allows us to be here today, 23rd September 2021 attending the Engineering International Conference (EIC) 2021. On behalf of committee, I am delighted to welcome all the participants, distinguished delegates, the experts and academics, from around the world to the 10th EIC this year.

The 10th EIC 2021 organized by Faculty of Engineering Universitas Negeri Semarang (UNNES) is conducted to support conservation and international reputation vision. Similar with our previous conference of EIC 2020, EIC 2021 will be held online via webinar due to the impacts of the Coronavirus Disease (COVID-19) around the world. 110 participants from Qatar, Malaysia, Taiwan, Thailand, and Indonesia are joined in EIC 2021.

As an annual conference in engineering, EIC provides a highly competitive forum for informing and reporting the latest developments of concept and application of green technology. The parallel sessions of the conference can be the place for presenters from the engineering areas to share their research results, exchange new ideas, information, and application related to the theory, design, development, implementation, testing or evaluation in the areas of green technology. The concepts of green technologies, can facilitate the goals of keeping the environment intact and improving it for civilization to survive.

This conference focuses on the goals of green technologies, which are becoming increasingly important for ensuring sustainability, provides a different perspective of green technology in the sectors of energy, materials, production, IT and control, building and construction, as well as waste management and transportation. This conference is expected to bridge the gap between the scientific community and policymakers. The accepted and presented paper after peer reviewed will be published in **IOP Conference Series: Earth and Environmental Science (Scopus indexed)**, Journal of Advanced Research in Fluid Mechanics and Thermal Sciences (Scopus indexed), ASEAN Journal of Chemical Engineering (Scopus indexed), Jurnal Bahan Alam Terbarukan (SINTA 2 indexed), Jurnal Teknik Elektro (SINTA 2 indexed), and ISSN International Conference Proceeding.

I would like to thank to the dean and vice dean of faculty of engineering, the keynote speakers, reviewers, and organizing committee for their hard work.

I also would like to express our gratitude to all publishers, our partners from Faculty of Engineering, Mahasarakham University, sponsors and individuals who have contributed to the events and success of this conference. Finally, welcome to EIC e-conference 2021 and we wish you a fruitful conference.

Warm regards,

Dr. Prima Astuti Handayani, S.T., M.T.

Chair of EIC 2021

TECHNICAL COMMITTEE

Advisor	:	Dr. Nur Qudus, M.T., IPM Dr. -Ing. Dhidik Prastiyanto, S. T., M. T. Dra. Sri Handayani, M. Pd. Dr. Wirawan Sumbodo, M. T. Dr. Dewi Selvia Fardhyanti, S. T., M. T.
Chairman	:	Dr. Prima Astuti Handayani, S. T., M. T.
Secretary	:	Sita Nurmasitah, S.S., M.Hum. Atika, S.Pd., M.Pd. Maharani Kusumaningrum, S.T., M.Eng.
Treasurer	:	Delta Apriyani, S.Pd., M.Pd. Radenrara Dewi Artanti Putri, S. T., M. T. Caecilia Sri W, S.E.
Publication Team	:	Samsudin Anis, S. T., M. T., Ph. D. Adhi Kusumastuti, S.T., M.T., Ph.D. Haniif Prasetiawan, M. Eng. Esa Apriaskar, S.T., M.T. Angga Septiyanto, S.Pd., M T. Nadya Alfa Cahaya Imani, S.T., M.Eng.
Public Relation	:	Zuhriyan Ash Shiddieqy Bahlawan, M. T. Irene Nindita Pradnya, S.T., M.Sc.
Sponsorship	:	Dimas Wicaksono, S.T., M.Eng. Nur Azis Salim, S.T., M.Eng.
IT & Web System	:	Nur Iksan, S. T., M. Kom Ari Dwi Nur Indrawan M, S.Pd., M.Pd. Febrian Arif Budiman, S. Pd., M. Pd. Riska Dami Ristanto, S.Pd., M.Pd. Andi Suhono, S.Pd. Hanrian Rosa Ahmad Rifaldi
Secretariat	:	Sarwi Asri, S.Pd., M.Pd. Asti Dwi Afidah, A. Md. Masni Maksiola, A.Md
Equipment	:	Widi Widayat, S. Pd. Heri Purnomo Hadi Waluyo

SCIENTIFIC COMMITTEE

Dr. Kongkiti Phusavat

Professor

Department of Industrial Engineering,
Kasetsart University, **Thailand**

Dr. Achmad Nizar Hidayanto

Professor

Faculty Of Computer Science
Universitas **Indonesia**

Dr. Wahyu Caesarendra

Associate Professor

Faculty Of Intergrated Technologies
Universiti **Brunei Darussalam**

Naraphorn Paoprasert, Ph.D.

Associate Professor

Department of Industrial Engineering,
Kasetsart University, Thailand

Dr. Ir. Sunjoto, Dip.HE, DEA.

Professor

Department of Civil & Environment Engineering,
Gadjah Mada University, Indonesia

Fernando Lopez-Caballero, Ph.D.

Associate Professor

Centrale Sup^{elec} Laboratoire MSS Mat Grande Voie des Vignes 92290 - Ch^{atenay} -
Malabry, **France**

Dr. Bambang Haryadi

Professor

Civil Engineering Department
Universitas Negeri Semarang, Indonesia

Boon Cheong Chew, Ph.D.

Associate Professor

Department of Technology, Management Faculty of Technology Management &
Technopreneurship (FPTT)
Universiti Teknikal Malaysia Melaka (UTeM), **Malaysia**

Samsudin Anis, Ph.D.

Associate Professor

Mechanical Engineering Department
Universitas Negeri Semarang, Indonesia

CONFERENCE SCHEDULE

TIME*	SCHEDULE
08.00 – 08.25	Opening
08.25 – 08.35	Opening Speech by EIC 2021 Chairman Dr. Prima Astuti Handayani
08.35 – 08.45	Speech and opening by UNNES Rector Prof. Dr. Fathur Rokhman, M.Hum.
08.45 – 09.00	Photo session and announcement.
09.00 – 09.30	KEYNOTE SPEECH SESSION 1 Moderator: Muhammad Faizal Ardiansyah Arifin, S.T., M.T., Ph.D. Keynote 1: Assoc Prof. ENOMOTO Hiroshi Faculty of Mechanical Engineering, Institute of Science and Engineering, Kanazawa University
09.30 – 10.00	Keynote 2: Prof. Shu-Shun Liu, Ph.D. National Yunlin University of Science and Technology
10.00 – 10.30	Question and answer session for keynote speech session 1
10.30 – 11.00	KEYNOTE SPEECH SESSION 2 Moderator: Dr. Widi Astuti, S.T., M.T. Keynote 1: Dr. Junaidah Jai School of Chemical Engineering, College of Engineering, Universiti Teknologi MARA
11.00 – 11.30	Keynote 2: Prof. Dr. Wara Dyah Pita Rengga, S.T., M.T. Department of Chemical Engineering, Faculty of Engineering, Universitas Negeri Semarang
11.30 – 12.00	Question and answer session for keynote speech session 2
12.00 – 13.00	Break
13.00 – 16.00	Parallel Session
16.00 – 16.30	Closing and announcement

Note: * Western Indonesian Time (WIB), UTC +7 (Jakarta Time)

Extractive Distillation of Ethanol/Water with 1-Butyl-3-Methylimidazolium Bromide Ionic Liquid as a Separating Agent: Process Simulation

Dhoni Hartanto^{1*}, Widi Astuti¹, Irene Nindita Pradnya¹, Yulian Candra Purwana¹,
Maftukhaturrizqiyah¹, Neila Hidayah Safitri¹, Agung Ari Wibowo², Riza Mazidu
Sholihin^{3,4}, Achmad Chafidz^{5,6}, and Ianatul Khoiroh⁷

¹Department of Chemical Engineering, Faculty of Engineering, Universitas Negeri Semarang, Kampus Sekaran, Gunungpati, Semarang, 50229, Indonesia

²Department of Chemical Engineering, Politeknik Negeri Malang, Jl. Soekarno-Hatta No. 9, 64415, Indonesia.

³RSUD Dr. Harjono, Pakunden, Ponorogo, 63419, Indonesia

⁴Akafarma Sunan Giri Ponorogo, Jalan Batoro Katong, Ponorogo 63411, Indonesia

⁵Department of Chemical Engineering, Universitas Islam Indonesia, Yogyakarta, 55584, Indonesia

⁶Department of Chemical Engineering, National Taiwan University, Taipei 10617, Taiwan

⁷Department of Chemical and Environmental Engineering, Faculty of Engineering, University of Nottingham Malaysia, Jalan Broga, Semenyih, 43500 Selangor Darul Ehsan, Malaysia

*Corresponding author: dhoni.hartanto@mail.unnes.ac.id

Abstract. The purification of ethanol has become a recent great interest because ethanol can be used as renewable energy, solvents in many industries, and for medicinal purposes. The separation of ethanol from water is challenging because the azeotropic point has appeared in this binary mixture. The extractive distillation technology is one of the most interesting methods to separate ethanol from water due to the competitiveness of its energy consumption and capital investment costs. Ionic liquid such as 1-butyl-3-methylimidazolium bromide [BMIM] [Br], which is categorized as green solvent, produces a significant salting-out effect in the ethanol-water system. This makes ionic liquid become a promising solvent in ethanol-water separation. In this study, the extractive distillation of ethanol-water system with 1-butyl-3-methylimidazolium bromide as a solvent was simulated. The simulation and sensitivity analysis were performed on Aspen Plus Process Simulator to obtain the optimum configuration. The NRTL thermodynamic model was used in this study. The effects of the number of stages (NS), binary feed stage (BFS), entrainer feed stage (EFS), and reflux ratio (RR) to the ethanol concentration with minimum energy requirements were studied. The most optimum configuration to produce a high concentration of ethanol with less energy are NS 28, BFS 22, EFS 4, and RR 1.5.

CFD Analysis of Damping Characteristics of a Hydraulic Damper through Throttling Velocity Variation

Thaer M. I. Syam*, Mohamed A. Arab, Ahmed Gamil, Yousif Badri, and Saud Ghani

Department of Mechanical and Industrial Engineering, Qatar University, Doha, Qatar

*Corresponding author's email: ts1405457@qu.edu.qa

Abstract. Shock absorbers or hydraulic dampers are a power dissipating device and fluid flow is governed through predefined passages. This fluid flow passages are responsible for variation in the damping or hydraulic characteristics in terms of damping force with respect to velocity. The piston inside the damper has a various orifice or piston valves that cause different flow losses. A Computational Fluid Dynamics (CFD) method is used to validate a previous study and investigate a modified model. The previous study has shown the numerical and experimental damping characteristics of a rear side two-wheeler automobile mono tube damper for different number of orifices in the piston which are two, six and ten orifices opening. CFD analysis is carried out for different number of orifices in the piston to validate the damping characteristics of a shock absorber. The throttling velocities are changing. A total of 48 simulations are done, simulations are compared with the previous numerical and experimental results and have shown agreement. A modified model is proposed and its damping characteristics are studied.

The Effect of Hydroxyapatite Concentration on the Mechanical Properties and Degradation Rate of Biocomposite for Biomedical Applications

D.F. Fitriyana^{1*}, F.W. Nugraha², M.B. Laroybafih^{2,3}, R. Ismail^{2,3}, A.P. Bayuseno², R.C. Muhamadin^{2,3}, M.B. Ramadana², A.R.A. Qudus¹, and J.P. Siregar⁴

¹Mechanical Engineering dept. Universitas Negeri Semarang, Indonesia

²Mechanical Engineering dept. Diponegoro University, Semarang, Indonesia

³Center for Biomechanics, Biomaterial, Biomechatronics, and Biosignal Processing, Diponegoro University, Semarang, Indonesia

⁴College of Engineering, Universiti Malaysia Pahang, 26300 Gambang, Kuantan, Malaysia

*Corresponding author's email: deniifa89@mail.unnes.ac.id

Abstract. Biocomposite is a material that have potential to heal injured bones and teeth due to their biocompatible, non-toxic, non-inflammation, and bioactive properties which can prevent infections that occurs frequently during surgical processes. Biocomposites made of PLA, PCL, and HA from bovine bone as a substitute for metal materials in medical applications have been widely studied. However, there are limited studies on the biocomposites made of PLA, PCL, and HA from green mussel shells. Therefore, this study aims to produce biocomposites from Polylactic Acid (PLA), Polycaprolactone (PCL), and Hydroxyapatite (HA) from green mussel shells and to determine the effect of HA concentration on the mechanical properties and degradation rate of the resulting biocomposite. 80 ml of chloroform was used to dissolve 16 grams of a PLA/PCL mixture with a composition of 80% and 20%. After 30 minutes, the solution was agitated for 30 minutes with a magnetic stirrer at 50°C and 300 rpm. After obtaining a homogenous solution, hydroxyapatite was added in percentages of 5%, 10%, 15%, and 20% of the total weight of the PLA/PCL mixture. The resulting mixture is poured into a glass mold in accordance with ASTM D790. Three-point bending, density, and biodegradable test were performed to investigate the effect of HA content on the mechanical properties and degradation rate of the biocomposite. The results of this study indicate that the mechanical properties of the biocomposite improved with the HA concentration increases. However, the more HA content used, the faster the biocomposite degrades.

Design and Development of Temporary Immersion Bioreactor System Controlled by Microcontroller

Akarawit Woowong¹ and Nawarat Piladaeng^{2*}

¹Department of Electrical and Computer Engineering, Faculty of Engineering,
Mahasarakham University, Kantarawichai, Maha Sarakham, 44150, Thailand

²Research Unit for Computational Electromagnetics and Optical Systems (CEMOS),
Faculty of Engineering, Mahasarakham University, Kantarawichai, Maha Sarakham,
44150, Thailand

*Corresponding author's email: nawarat.p@msu.ac.th

Abstract. This research aims to develop, design and construct a temporary immersion bioreactor (TIB) controlled by microcontroller. The designed TIB system can control the time for plant feeding and the carbon dioxide concentration via application which makes it convenient to the user for defining the operating times of the system. The constructed TIB consists of 2 sets of the plant tissue culture containers. The TIB system can define the feeding time up to 10 time periods per day and also can set the time to control carbon dioxide concentration up to 4 time periods per day. The system starts to feed the plants at the set times and stop working when reaching the set time periods for plant feeding. For the carbon dioxide concentration control, the system operates during the defined time periods to measure and adjust the carbon dioxide concentration following the set values. The test results of the feeding time control illustrated that the constructed TIB system could set the feeding times conveniently and quickly. Moreover, the system could properly work following the set time periods. For the test results of the carbon dioxide concentration control, it was found that the TIB could control the carbon dioxide concentration in the containers during the set operating time periods. It took about 7, 28, 30, 36 and 21 minutes after the system started working to adjust the carbon dioxide concentration in order to be at the set levels of <750, 1,500, 2,000, 2,500 and 3,000 ppm, respectively. The carbon dioxide concentration control system could properly work with error less than 10%.