Book of Abstracts

Chemical Engineering

BEST 2019

BROAD EXPOSURE TO SCIENCE AND TECHNOLOGY

Professional Breadth and Tecnical Depth in Science, Green Technology, and Research for Sustainable Development

Prime Plaza Hotel - Sanur Bali, August 7th - 8th, 2019

WELCOME TO BEST 2019

On behalf of the Organizing Committee**, I take a great pride in welcoming all the attendees of the** Broad Exposure to Science and Technology (**BEST 2019). Allow me** to express my sincere appreciation to all distinguished speakers and participants for joining the conference. I would also like to thank all the members of BEST 2019 Committee and the International Advisory Board for their support and effort in preparing this conference. They have prepared this event eagerly to assure all activities during the conference would proceed perfectly.

BEST 2019 conference will include plenary lecturers and many oral communications to allow as many as possible attendants to present their scientific results on the different of engineering field. The manuscript which have presented orally will be published in IOP Conference Series: Materials Science and Engineering under peer-reviewed process.

I hope that the conference will provide you a wonderful forum to share your experiences and discuss recent issues in science and technology. It will give you the opportunity to meet and interact with the leading scientists, engineers, and researchers, friends and colleagues as well as sponsors and exhibitors.

Finally, I would like to thank, Universitas Pendidikan Nasional, Denpasar, Sorbonne Universités - UTC Compiègne France, Badan Kejuruan Kimia Persatuan Insinyur Indonesia, BKK-PII, for supporting this event. Hopefully, we can continue our collaboration in developing science and technology in upcoming activities.

Thank you,
Organizing Committee BEST 2019
ALFIRANO, Ph.D — Chairman
Dr. Endarto Y. WARDHONO — Co-Chairman

REKTOR SPEECH

Dear participans,

On behalf of the international and local organizing committees of the Broad Exposure to Science and Technology 2019 (BEST-2019), I express my warmest welcome to all participants of the BEST-2019 conference. It is a great honour for us to host this international event on 7-8 August, 2019 in Bali, Indonesia.

Sultan Ageng Tirtayasa University (Untirta), is a state university located in Serang, the capital city in Banten Province, Indonesia. Untirta has shown a strong commitment on development of science and technology since its establishment officially as a state university in 2001. Our support for the development of research and technology is to encourage our scientist to publish their scientific work into indexed-journals/proceedings.

BEST-2019 will provide a wonderful forum for you to refresh your knowledge base and explore the innovations in Material science, Metallurgy and Material, Chemical, Mechanical, Electrical, Industrial, and Civil Engineering. It will give you the opportunity to meet and interact with the leading scientists, engineers, and researchers, friends and colleagues as well as sponsors and exhibitors.

BEST-2019 is held for the first time this year, with co-host Universitas Pendidikan Nasional, Bali, Indonesia and Sorbonne Universitès-UTC Compiègne, France as our research partner. It brings together leading scientist, technologist and engineers from around the world to discuss cotemporary discoveries and innovations in the rapidly evolving field of Material Science and Engineering, Chemical Engineering, Mechanical Engineering, Electrical Engineering and Information Technology.

This event is also intended to foster stronger and closer interaction between practitioners and their international counterparts. The conferences covers engineering aspect and the processes by which the are produced. Particular emphasis is placed on 6 symposia, covering over 200 presentation and 200 papers in the proceedings. A truly unique feature of the BEST-2019 conference is the large number, (over 200) plenary, keynote and invited speakers; of internationally distinguished scientist, engineers and the technologist. It would be difficult to make this large-scale event successful without the active participation of these distinguished experts. I gratefully appreciate their tremendous support.

I would like to express my deep appreciation of the great efforts made by the country technical representatives, symposia chairs, members of the organizing committees and the international advisory committee. We also acknowledge gratefully the financial support from the jointly sponsor.

Bali is an island that is known for having green volcanoes, unique rice terraces, beaches and beautiful coral reefs. There are many religious sight such as Uluwatu Temple which stands on a cliff. In the South, the coastal city of Kuta offers nightlife tours that are never quiet, while Seminyak, Sanur, and Nusa Dua are known as popular resort treats. The island of Bali is also known as a place for relaxation with yoga and meditation.

I wish all of you an enjoyable time at this conference and in Bali, Indonesia.

Prof. Dr. H. Sholeh HIDAYAT, M.Pd — Rector Universitas Sultan Ageng Tirtayasa

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KEYNOTE SPEAKER

Prof. Zenji HORITA, Ph.D

Zenji Horita was born in Fukuoka, Japan., in 1953. He received the B.S and M.S degrees in Department of Materials Science and Engineering, Kyushu University, Fukuoka, Japan, in 1977 and 1979, respectively. He received the Ph.D degree in Department of Materials Science, University of Southern California, Los Angeles, CA, USA, in 1983. He is a Professor in Department of Materials Science and Engineering, Kyushu University, Fukuoka, Japan; Professor in School of Engineering, Kyushu Institute of Technology, and Professor in Synchrotron Light Application Center, Saga University. Currently he served as Editor in Chief, Japan Institute of Metals and Materials.

Prof. Khashayar SALEH

Khashayar SALEH received a B.S. degree in Chemical Engineering from Sharif (Aryamehr) university of technology (Tehran/Iran) in 1992. He prepared a PhD thesis on the coating of fine powders in the Chemical Engineering Laboratory of Toulouse and obtained his PhD degree in 1998 from Institut National Polytechnique de Toulouse (France). Prof. K. Saleh is currently the head of the chemical engineering department of the Compiègne University of Technology. His work is focused on powder technology including size enlargement technology, powders electrification and powder's characterisation methods.

Prof. Poki CHEN, B.S., M.S., Ph.D

Poki Chen was born in Chia-Yi, Taiwan, R.O.C., in 1963. He received the B.S., M.S. and Ph.D. degrees in Electrical Engineering Department from National Taiwan University (NTU), Taipei, Taiwan, in 1985, 1987 and 2001, respectively. During 1998-2001, 2001-2006 and 2006-2011 he was a Lecturer, an Assistant Professor, and an Associate Professor correspondingly in Electronic Engineering Department of National Taiwan University of Science and Technology (NTUST). He is a Professor in Electronic and Computer Engineering Department of NTUST. Currently, he serves as the Associate Editors for IEEE Transactions on Very Large Scale Integration Systems (TVLSI) and IEEE Access since 2011 and 2013. He is the organizer of IEEE International Conference on Intelligent Green Building and Smart Grid (IGBSG) since 2014 and serves as keynote/invited speakers, TPC members, session chairs for various IEEE conferences, such as SOCC, VLSI-DAT, IFEEC, ISESD, NoMe TDC, ISNE, ASID … and so forth.

His research interests include analog / mixed-signal IC design and layout with special interest in time-domain signal processing circuits, such as time-domain smart temperature sensor, time-to-digital converter (TDC), digital pulse converter (DTC), time-domain ADC and high accuracy DAC. He is also interested in creating innovative analog applications for FPGA platforms, such as FPGA smart temperature sensor, FPGA digital-to-time and time-to-digital converters.

Prof. Dr. -Ing. Hendro WICAKSONO

Hendro Wicaksono received the B.Sc. in Computer Science from Institut Teknologi Bandung, Indonesia, in 2002; M.Sc. in Information and Communication Engineering from University of Karlsruhe, Germany, in 2006; Ph.D in IT for engineering, from Karlsruhe Institute of Technology, Germany, in 2016. During 2018 – now he was a Professor of Industrial Engineering and Head of INDEED Workgroup in Jacobs University Bremen.

His research focuses in digital infrastructure for smart city and smart factory, industry 4.0 readiness and risk assessment, multilevel and lifecycle oriented economic and ecological sustainability analysis, statistical analysis and machine learning for predictive analytics.

Prof. Hakim NACEUR

Hakim Nacer received M.Sc. in Computational Structural Mechanics, Université Paris, in 1994; Ph.D in Mechanical Engineering, Université de Technologie de Compiègne, France, in 1998.

His research areas in Modeling of the impact of Composite Shell Structures using Meshless Methods, Homogenization techniques and multi-scale approaches in crash and impact, Biomechanical modeling of hard tissues with porosity for energy dissipation in shocks, and Numerical Modeling & Optimization of sheet metal forming Processes.

Dr. Muhammad Roil BILAD

Muhammad Roil BILAD is currently an Assistant Professor at Department of Chemical Engineering Universiti Teknologi PETRONAS (UTP) Malaysia (2016-present). He has 12+ years of research experience in different aspects of membrane science and technology, including membrane synthesis, module development, membrane bioreactor, membrane fouling control, forward osmosis and membrane distillation. He has published over 66 ISI high impact journals, inventor/co-inventor of 3 patents and has delivered 30+ technical talks. His projects have involved collaborators from universities (KU Leuven university, Masdar Institute of Science and Technology, Nanyang Technological University, Massachusetts Institute of Technology, etc.), companies (Amer-Sil, Aquaporin, etc.) and research institutes (VITO, TERI, DHI, etc). Before joining UTP, he worked as research fellow in SMTC (Singapore, 2015-2016), post-doctoral researcher in Masdar Institute (UAE, 2013-2015) and research associate KU Leuven (Belgium, 2012-2013) where he obtained his PhD. His main research interest is on process intensification involving membrane. Currently he is developing plate-and-frame module panel for both liquid based filtrations (MD, MF and FO), exploring sweet spot of FO applications for recovery of resources from wastewater and for treatment of produced water from oil and gas industries, simulating/modelling biodiesel production using catalytic membrane reactor, etc.

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SCHEDULE

CONFERENCE PROGRAMME

Wednesday, August, 7 2019

Time		Agenda
07.30	09:30	**Registration**
08:15	10:03	**Parallel Session 1**
		Opening Ceremony
10:00	10:10	Welcome dance
10:12	10:17	Speech 1: Badan Kejuruan Kimia Persatuan Insinyur Indonesia, BKK-PII. Ir. Ricky Hikmawan Wargakusumah, MH, IPM
10:19	10:24	Speech 2: Sorbonne Universités-UTC Compiègne, France Prof. Jean Louis Batoz,
10:26	10:31	Speech and opening: Universitas Sultan Ageng Tirtayasa, Banten Prof. Sholeh Hidayat
10:33	10:43	**Coffee Break**
		Plenary session 1: Chair: Dr. Sri Agustina, Universitas Sultan Ageng Tirtayasa, Banten
10:45	11:15	**Keynote 1**: Prof. Zenji Horita, Kyushu University Japan Theme: Nanostructural refinement for advanced materials.
11:17	11:47	**Keynote 2**: Prof. Khashayar Saleh, Sorbonne Universités-UTC Compiègne France Theme: Chemical engineering in the heart of the green car
11.49	12:19	**Keynote 3**: Poki Chen, National Taiwan University of Science and Technology, NTUST Theme: Maximizing the efficiency of CMOS front-illuminated photovoltaic for self-powered sensor applications
12:21	12:36	**Invited speaker 1**: Charmeida Tjokrosuwarno, MA, M. Com, MPM, Katama Inovasi Global Theme: Pondasi Ramah Gempa: Konstruksi Sarang Laba-Laba
12.38	14:08	**Lunch Break**
13:45	15:33	**Parallel Session 2**
15:35	15:55	**Coffee Break**
15:57	18:07	**Parallel Session 3**

Thursday, August, 8 2019

Time		Agenda
08:00	**10:10**	**Parallel Session 4**
10:12	**10:27**	Coffee Break
		Plenary session 2:
		Chair: Agus Putu Abiyasa, Ph.D
10:29	**10:59**	**Keynote 4**: Prof. Hendro Wicaksono, Jacobs University Bremen Germany
		Theme: Key preparations for industry 4.0: technologies, business, education, attitude
11:01	**11:31**	**Keynote 5**: Prof. Hakim Naceur, Université Polytechnique Hauts-de-France
		Theme : Recent advances in particle methods for the modeling of computational mechanics problems
11:33	**11:48**	**Invited Speaker 2**: Ir. Helmilus Moesa, Candra Asri Petrochemical,
		Theme: Perkembangan Industri Petrokimia di Indonesia - Tantangan bagi Perguruan Tinggi untuk Penyediaan Teknologi Proses dan SDM Unggul.
11:50	**12:20**	**Keynote 6**: Dr. M. Ro'il Bilad, Universiti Teknologi Petronas, Malaysia
		Theme: Fouling control in membrane processes for sustainable operation: module development approach
12:22	**12:37**	Certificate hand over
12:40	**14:10**	**Lunch Break**
13:45	**15:55**	**Parallel Session 5**
15:57	**16:12**	**Coffee Break**
16:14	**18:22**	**Parallel Session 6**

➢ Wednesday, August, 7 2019

PARALLEL SESSION 1																				
Track	Time		Ball room 1	Ball room 2	Industrial		Chemical		Civil		Mechanical		Metal & Material	
					Chair: Anna, UGM		Chair: Nufus, UNTIRTA		Chair: Rifky, UNTIRTA		Chair: Bambang, ITS		Chair: Erlina, UNTIRTA	
					Room 1		Room 2		Room 3		Room 4		Room 5	
					SINGARAJA		MANGUPURA		TABANAN		AMLAPURA		BANGLI	
1	08:15	08:35			FP-256	Asep, UNTIRTA	FP-342	Widya, UNTIRTA	FP-277	Ghefra, UI	FP-371	Erwin, UNTIRTA	FP-339	Faiz, UNTIRTA
2	08:37	08:57			FP-153	Sekar, UGM	FP-370	Lucky, UII	FP-157	Dwi, UNTIRTA	FP-361	Imron, UNTIRTA	FP-347	Henry, ITS
3	08:59	09:19			FP-273	Imam, UII	FP-330	Warda, UNTIRTA	FP-243	Bella, KPP	FP-129	M. Haekal, BSN	FP-220	Fachri, UI
4	09:21	09:41			FP-179	Lely, UNTIRTA	FP-258	Muthia, UNLAM	FP-323	Yoshi, UI	FP-305	Agung, UNTIRTA	FP-164	Ferriawan, UGM
5	09:43	10:03			FP-412	Joko, UII			FP-391	Desy, UI	FP-304	Edisah, UNSYIAH	FP-403	Yeni, UNTIRTA

PARALLEL SESSION 2																				
Track	Time		Industrial		Industrial 2		Chemical		Civil		Electrical		Mechanical		Metal & Materaial	
			Chair: Lely, UNTIRTA		Chair: Manik, UNDIP		Chair: Widya, UNTIRTA		Chair: Lita, UI		Chair: Abiyasa, UNDIKNAS		Chair: Agung, UNTIRTA		Chair: Yeni, UNTIRTA	
			Ballroom 1		Ballroom 2		Room 1		Room 2		Room 3		Room 4		Room 5	
6	13:45	14:05	FP-267	Kulsum, UNTIRTA	FP-337	Hasna, TELKOM	FP-152	Sutarsi, ITS	FP-296	Enden, UNTIRTA	FP-333	Dwi, UI	FP-272	Iman, UNTIRTA	FP-21	Erlina, UNTIRTA
7	14:07	14:27	FP-11	Bertha UGM	FP-329	Nuraida, UNTIRTA	FP-202	Yeni, ITS	FP-116	Gunawan, UI	FP-165	Agus, UNTIRTA	FP-24	Eui soo Kim, KNUT	FP-263	Rifai, BATAN
8	14:29	14:49	FP-13	Anna, UGM	FP-160	Sonna, ITH	FP-203	Yeni, ITS	FP-212	Samuel, UI	FP-353	Nurian, UI	FP-292	Nazar, UNDIP	FP-264	Rifai, BATAN
9	14:51	15:11	FP-169	Lintang, UNTIRTA	FP-426	Sugarindra, UII	FP-237	Naya, UI	FP-375	Restu, UNTIRTA	FP-410	Wahyuni, UNTIRTA	FP-414	Rina, UNTIRTA	FP-191	Amalia, UNTIRTA
10	15:13	15:33	FP-280	Harwati, UII	FP-176	Handoko, UI	FP-214	Azhar, UI	FP-425	Wibowo, UNDIP	FP-378	Haidar Ali, UI	FP-33	Syaiful, UNDIP	FP-405	Suryana, UNTIRTA
	15:35	15:55	Coffe break													

PARALLEL SESSION 3																				
Track	Time		Industrial 1		Industrial 2		Chemical		Civil		Electrical		Mechanical		Metal & Materaial	
			Chair: Asep, UNTIRTA		Chair: Imam, UII		Chair: Teguh, UNTIRTA		Chair: Lita, UI		Chair: Supri, UNTIRTA		Chair: Erwin, UNTIRTA		Chair: Faiz, UNTIRTA	
			Ballroom 1		Ballroom 2		Room 1		Room 2		Room 3		Room 4		Room 5	
11	15:57	16:17	FP-159	Nabila, ITS	FP-199	Punnatorn, KKU	FP-144	Firman, ITS	FP-310	Hendrian, UNTIRTA	FP-194	M. Agus, UI	FP-298	Jamila, PUHF	FP-287	Soesaptri, UNTIRTA
12	16:19	16:39	FP-294	Yuli, UII	FP-210	Phatraporn, KKU	FP-115	Ashaf, UNPAR	FP-217	Farah, UI	FP-367	Fadil, UNTIRTA	FP-107	Husaini, UNSYIAH	FP-319	Adinda, UI
13	16:41	17:01	FP-312	Prima, UNSYIAH	FP-363	Manik, UNDIP	FP-349	Denni, UNTIRTA	FP-221	Demarda, UI	FP-385	Bagus, UI	FP-108	Husaini, UNSYIAH	FP-178	Bening, UNTIRTA
14	17:03	17:23	FP-177	Maria, UNTIRTA	FP-185	Tri, UNTIRTA	FP-351	Medyan, UNSYIAH	FP-369	Andi, UNTIRTA	FP-400	Albert, UWM	FP-302	Hendriko, CALTEX	FP-120	Sugeng, UGM
15	17:25	17:45	FP-321	Wahyu, UNTIRTA	FP-197	Akhamd, SURYA	FP-389	Dhena, UNTIRTA	FP-376	Naniek, UNDIP	FP-381	Arief, UI	FP-193	Bambang, ITS	FP-383	Anis, UNTIRTA
16	17:47	18:07	FP-131	Haekal, BSN	FP-282	Andrie, UII	FP-308	Christian, ITS	FP-299	Wayan, UNTAD	FP-270	Romi, UNTIRTA	FP-25	Bambang, ITS	FP-209	Abdul, UI

➢ Thursday, August, 8 2019

PARALLEL SESSION 4																
Track	Time		Chemical			Industrial		Civil		Electrical		Mechanical		Metal & Material	
			Chair: Dhena UNTIRTA			Chair: Asep, UNTIRTA		Chair: Bagus Eratodi		Chair: Lily, UK PETRA		Chair: SidiK, UNTIRTA		Chair: Saptri, UNTIRTA	
			Ball room			Room 1		Room 2		Room 3		Room 4		Room 5	
1	08:00	08:20	ABS-235	Juliasih, UNILA		FP-390	Retno, TRUNOJOY	FP-213	Rindu, ITB	FP-320	Suhalni, UNTIRTA	FP-314	Ketut, UNTIRTA	FP-219	Muharam, UI
2	08:22	08:42	FP-222	Lucky, UII		FP-387	Renanto, UI	FP-311	Dwi, UNTIRTA	FP-139	Rocky, Kumamoto	FP-356	Darmanto, UI	FP-230	Didied, UNTIRTA
3	08:44	09:04	FP-274	Anisa, UI		FP-386	Danang, UII	FP-187	Erizka, UI	FP-350	Umar, UI	FP-388	Arif, UMS	FP-241	Rizki, UI
4	09:06	09:26	FP-309	Teguh, UNTIRTA		FP-317	Akbar, UNTIRTA	FP-368	Rama, UNTIRTA	FP-229	Fahmi, UI	FP-402	Agung, UMS	FP-365	Agus, UNTIRTA
5	09:28	09:48	FP-407	Nyoman, UNIPRA		FP-336	Rahayu, UGM	FP-192	Atmy, ITB	FP-211	Cakra, UNTIRTA	FP-408	M. Syahid, UNHAS	FP-15	Putra, UNUD
6	09:50	10:10	FP-279	Yani, LEMIGAS		FP-354	Putro, UNTIRTA	FP-316	Woelan, UNTIRTA	FP-364	Masjudin, UNTIRTA	FP-382	Agus, UNTIRTA	FP-226	Tuti, UI
	10:12	10:27	Coffe break												

PARALLEL SESSION 5

Track	Time		Chemical 1		Chemical 2		Industrial		Civil		Electrical		Mechanical		Metal & Material	
			Chair: Firman, ITS		**Chair: Sri, UNTIRTA**		**Chair: Putro, UNTIRTA**		**Chair: Mujiya, UNDIP**		**Chair: Wahyuni, UNTIRTA**		**Chair: Agus, UNTIRTA**		**Chair: Rifai, BATAN**	
			Ball room 1		**Ball room 2**		**Room 1**		**Room 2**		**Room 3**		**Room 4**		**Room 5**	
7	13:45	14:05	FP-283	Kusdianto, ITS	FP-182	Tri Widjaja, ITS	FP-340	Ade, UNTIRTA	FP-293	Soelarso, UTC	FP-12	Eva, UDP	FP-82	Wayan, UNUD	FP-61	Klodian, PUT
8	14:07	14:27	FP-224	Ilham, LEMIGAS	FP-10	Jabosar, ITERA	FP-324	Ade, UNTIRTA	FP-413	Baehaki, UNTIRTA	FP-17	Lily, UK PETRA	FP-303	Edisah, UNSYIAH	FP-419	Andini, UNTIRTA
9	14:29	14:49	FP-418	Yeyen, UNTIRTA	FP-195	Yustia. ITS	FP-377	Hasna, TELKOM	FP-281	Dadang, UI	FP-37	Supri, UNTIRTA	FP-404	Tjahjani, UMS	FP-8	Lutfi, UI
10	14:51	15:11	FP-138	Setyo, ITS	FP-207	Isni, UI	FP-133	Fikri, UII	FP-269	Bagus, UNDIKNAS	FP-357	Syarif, UNTIRTA	FP-384	Sidik, UNTIRTA	FP-147	Tri, UNTIRTA
11	15:13	15:33	FP-140	Setyo, ITS	FP-196	Andre, UI	FP-134	Eufrade, UII	FP-411	Bambang, UB	FP-397	Heri, UNTIRTA	FP-168	Yasid, UNDIP	FP-240	Calista, UI
12	15:35	15:55	FP-261	Sanggono, ITB	FP-218	Dhiyul, ITS	FP-248	Wahyudi, UII	FP-231	Nyoman, UNUD	FP-367	Fadil, UNTIRTA	FP-186	Nazar, UI	FP-255	Daisman, USAKTI
	15:57	16:12	**Coffe break**													

PARALLEL SESSION 6

Track	Time		Chemical 1		Chemical 2		Industrial		Civil		Electrical		Mechanical		Metal & Material	
			Chair: Nufus, UNTIRTA		**Chair: Sri, UNTIRTA**		**Chair: Ade, UNTIRTA**		**Chair: UNDIKNAS**				**Chiar; Iman, UNTIRTA**		**Chair: Rifai, BATAN**	
			Ball room 1		**Ball room 2**		**Room 1**		**Room 2**		**Room 3**		**Room 4**		**Room 5**	
13	16:14	16:34	FP-335	Kusdianto, ITS	FP-422	Anton, UNTIRTA	FP-338	Adam, UII	FP-278	Ghefra, UI			FP-343	Dwinanto, INSA	FP-260	Davino, UI
14	16:36	16:56	FP-143	Brario, ITS	FP-374	Irma, UNTIRTA	FP-236	Caesario, UII	FP-163	Zul, UNTIRTA			FP-174	Ichsan, Duisburg	FP-286	Gaton, BATAN
15	16:58	17:18	FP-420	Nufus, UNTIRTA	FP-416	Iman, UNTIRTA	FP-401	Ali, UII	FP-162	Zul, UNTIRTA			FP-137	Adha, UNTIRTA	FP-322	Febriyanti, ITS
16	17:20	17:40	FP-205	Effendy, UNESA	FP-414	Alfirano, UNTIRTA	FP-406	Novaldi, TELKOM	FP-344	Rifky, UNTIRTA			FP-392	Untung, UMB	FP-121	Galih, UI
17	17:42	18:02			FP-417	Dhimas, UNTIRTA	FP-427	Chanchard, UII	FP-352	Uri, Duisrburg			FP-325	Agus, UMS	FP-124	Putra, UNUD

INDUSTRIAL ENGINEERING

No	ID	Name	Title	Univ
1	FP 11	Bertha Maya Sopha	Identifying Aid Items of Survival Kit for Natural Disasters	UGM
2	FP 13	Anna Maria Sri Asih	Analysis of Coal Allocation on Steam Power Plants and The Effect of Multi-Suppliers, Demand and Time Variations on Coal's Safety Stock	UGM
3	FP 131	M. Haekal Habibie	Risk-Based Thinking on Calibration and Testing Laboratory: Current Challenge in Transition Periode	BSN
4	FP 133	M Fikri Perdana	The Usability of The Educational Board Game for Learning English	UII
5	FP 134	Eufrade Putra	Ergo-Innovative Design of the Assistance Appliance for Slaughtering the Cow	UII
6	FP 137	Muhammad Adha Ilhami	Bibliometric analysis of the term "Three-Dimensional Concurrent Engineering"	UNTIRTA
7	FP 153	Sekar Sakti	A Computerized Measurement System of Machine Performance for A Textile Industry	UGM
8	FP 159	Nabila Yuraisyah Salsabila	A Simulation Study of Availability Analysis on a Chemical Process Industry Considering Spare Part Inventory	ITS
9	FP 160	Sonna Kristina	Minimize Transportation Cost with Clark and Wright Algorithm Saving Heuristic Method With Considering Traffic Congestion Factor	ITHB
10	FP 169	Dyah Lintang Trenggonowati	ORGANIZATION CLUSTERING AIRPORT USING K-MEANS CLUSTERING ALGORITHM	UNTIRTA
11	FP 176	Handoko Purwojatmiko	Evaluation Acoustic Performance in Classroom: A General Factorial Design	UI
12	FP 177	Maria Ulfah	Control of Production Process to Minimize Potential Failures Using Lean Six Sigma and Multi Attribute Failure Mode Analysis Approaches	UNTIRTA
13	FP 179	Lely Herlina	Fuzzy Inference System for Evaluating Supplier in Shrimp Agroindustry	UNTIRTA
14	FP 185	Tri Partuti	Effect Of Online Shopping System On Consumptive Behaviour Of Female Workers In Cilegon Region	UNTIRTA
15	FP 197	Akhmad Sutoni	Analysis of Replacement and Selection of Machines at Rice Milling Plants Using Dynamic Program and Analytical Hierarchy Process (AHP) Methods	Suryakancana University
16	FP 199	Punnatorn Mathong	The development of a tool to assess the quality of service for beverage logistics	Khon Kean University
17	FP 210	Phatraporn Chain	Using Cluster Analysis for Location Decision Problem	Khon Kean University
18	FP 236	Caesario Isak Cornelis	Two Step Optimization of Natural Gas Power Generation Location and Pipe Supply System	UII

19	FP	248	Wahyudhi Sutrisno	Analysis Of Provider Training Business Model Development Based On Canvas Business Model Approach	UII
20	FP	256	Asep Ridwan	Design of Strategic Risk Mitigation with Supply Chain Risk Management and Cold Chain System Approach	UNTIRTA
21	FP	267	Kulsum none	JOB SHOP SCHEDULING USING NON DELAY AND HEIJUNKA INTEGRATION AT PT X (CASE STUDIES OF MANUFACTURING COMPANIES)	UNTIRTA
22	FP	273	Imam Djati Widodo	THE OPTIMAL DESIGN OF ELECTRIC CABLE CONDUCTOR AND INSULATOR RESISTANCE USING TAGUCHI MULTIRESPON METHOD	UII
23	FP	280	Harwati	The Implementation of Green Lean Manufacturing in Small Scale Industry: Reduction Energy Waste and Emission	UII
24	FP	282	Andrie Pasca Hendradewa	Productivity Improvement of Assembly Department By Using Value Stream Mapping and Computer Simulation Approach	UII
25	FP	294	Yuli Agusti Rochman	A Conceptual Framework For Lean Manufacturing Implementation In Small And Medium Enterprises	UII
26	FP	312	Prima Denny Sentia	The Design of Cold Chain Risk Management System of Frozen Tuna Product in Acheh Using Fuzzy Logic	UNSYIAH
27	FP	317	Akbar Gunawan	DESIGNING BASED MARKETING INFORMATION SYSTEMS WITH CMS WORDPRESS IN CV DUTA DHARMA	UNTIRTA
28	FP	321	Wahyu susihono	Total Ergonomics Intervention Perfecting Has-23000 Implementation In The Cake Processing Industry; Case Study In The ” Gipang Tiga Bunda” Cake Industry Of Cilegon City	UNTIRTA
29	FP	324	Ade Irman	Minimizing Makespan on Flow Shop Scheduling Using Campbel Dudek And Smith, Particle Swarm Optimization, and Proposed Heuristic Algorithm	UNTIRTA
30	FP	329	Nuraida Wahyuni	Measurement of E-Service Quality from User Perceptions using the IPA-KANO Integration Model	UNTIRTA
31	FP	336	Rahayu Khasanah	Evaluation of Turnaround Maintenance Practice Effects in the Process Industry	UGM
32	FP	337	Nuraida Wahyuni	Designing Employee Workload Calculation Based on Java-based Full Time Equivalent Method	UNTIRTA
33	FP	338	Adam Mulia	DETERMINATION OF IDEAL WAREHOUSING CAPACITY AND INVENTORY CONTROL OF NPK FERTILIZER RAW MATERIALS (DAP, KCL POWDER, CLAY)	UII
34	FP	340	Ade Irman	Minimizing Makespan on Flow Shop Scheduling Using Campbel Dudek And Smith, Particle Swarm Optimization, and Proposed Heuristic Algorithm	UNTIRTA
35	FP	354	Putro Ferro Ferdinant	Perception of Taxi Online Service Users Toward Women Drivers Based on Kano Models	UNTIRTA
36	FP	363	Manik Mahachandra	Assessing Driver Distraction on Simulated Driving	UNDIP
38	FP	377	Hasna Nurhasanah	An Optimum Condition-Based Maintenance and Spare Parts Provisioning Based on Markov Chains	Telkom University
39	FP	386	Danang Setiawan	Maintenance system design on air jet loom (AJL) machine using Reliability Centered Maintenance (RCM)	UII

40	FP	387	Renanto Pandu Wirawan	Yield Optimization of the Slow Pyrolysis Process of Plastic Waste to Oil Fuel with Factorial Design	UI
41	FP	390	Retno Indriartiningtias	Key Factors of Success Technology Transfer from Higher Education To Creative Industry in Bangkalan, Madura	Trunojoyo Univ.
42	FP	392	Untung Mardono	Design Analysis of Raw Materials Inventory on TC1118 Cloth Products with JIT Approach	Mercu Buana University
43	FP	401	Ali Purkhan	Optimal Design of Mechanical and Physical Quality of Pottery Using TOPSIS Method	UII
44	FP	406	Novaldi	Supply Chain Risk Management Design in Nagoya Ina Engineering With A House Of Risk Model	Telkom University
45	FP	412	Joko Sulistio	Productivity Improvement of Assembly Department By Using Value Stream Mapping and Computer Simulation Approach	UII
37	FP	426	Muchamad Sugarindra	Analysis and Information System Designs of Surveillance Infection Control System in the Hospital	UII
46	FP	427	Chancard Basumerda	Warehouse Server Productivity Analysis with Objective Matrix (OMAX) Method	UII
6	FP	144	Firman Kurniawansyah	Development of Bamboo-Derived Activated Carbon as Catalyst Support of Glucose Hydrogenation	ITS
7	FP	152	Sutarsi sutarsi	Effect of Operating Condition on Curcumin Extract from Curcuma xanthorriza Roxb. using Supercritical Fluid Method	ITS
8	FP	182	Tri Widjaja	Performance of Biogas Production from Coffee Pulp Waste using Semi-Continue Anaerobic Reactor	ITS
9	FP	195	Yustia Wulandari	Kinetic Study of Catalytic Hydrocracking Ceiba pentandra oil to Liquid Fuels over Nickel-Molybdenum/HZSM-5	ITS
10	FP	196	Andre Fahriz	Production of Formic Acid from Oil Palm Empty Fruit Bunch via Dilute Acid Hydrolysis by Response Surface Methodology	UI

11	FP	202	Yeni Variyana	Optimization using Solvent Free Microwave Extraction of Oil from Allium sativum L. Through Microwave Hydrodiffusion and Gravity Technique	ITS
12	FP	203	Yeni Variyana	Optimization of Microwave Hydro-Distillation from Lemongrass Leaves (Cymbopogon Nardus) by Response Surface Methodology	ITS
13	FP	205	Mohammad Effendy	Effect of Interparticle Diffusion on Methane Catalytic Oxidation Performance on Reverse Flow Reactors	UNESA
14	FP	207	Isni Nur Sadrina	Effect of Microwave Assisted Sodium Hydroxide Pretreatment on Hemicellulose Content of Oil Palm Empty Fruit Bunch for Furfural Production	UI
15	FP	214	Azhar Aditya Rahman	Optimization of Microwave Assisted Dilute Ammonia Pretreatment of Oil Palm Empty Fruit Bunch using Response Surface Methodology	UI
16	FP	218	Dhiyaul Helmi Ihsanti	Fischer-Tropsch Process From Synthesis Gas Over Fe-Co/HZSM-5 Catalyst to Produce Biofuel	ITS
17	FP	222	Lucky Wahyu Nuzulia Setyaningsih	Triacetin Production by Selective Esterification of Glycerol over Activated Zeolite and Lewatite as Catalyst	UII
18	FP	224	Ilham Ardatul Putra	DEVELOPMENT OF SIMULTAN QUANTIFICATION OF NONIONIK SURFACTAN IN CHEMICAL FLOODING USING MOBILE 1H NMR	LEMIGAS
19	FP	237	Naya Prakasita Putri	Biosurfactant Screening of Halomonas meridiana BK-AB4 for Microbial Enhanced Oil Recovery	UI
20	FP	258	Muthia Elma	Effect of two stages adsorption as pre-treatment of Natural Organic Matter removal in ultrafiltration process for peat water treatment	UNLAM
21	FP	261	Sanggono Adisasmito	Laterite for Hydrogen Sulphide Adsorption from Biogas	ITB
22	FP	274	Anisa Maulida	Activated Carbon Production by Co-Pyrolysis of Vacuum Residue and Gum Rosin	UI
23	FP	279	Yani Faozani Alli	The Effect of Injection Rate from a Novel Natural-Oil Based Surfactant on the Capillary Number for Reducing Residual Oil Saturation	LEMIGAS
24	FP	283	Kusdianto	Characterizations of Ag doped ZnO nanoparticles via flame pyrolysis method for degradation of methylene blue	ITS
25	FP	308	Christian Julius	Hydrophobic modification of cellulose nanocrystals from bamboo shoots using rarasaponins	ITS
26	FP	309	Teguh Kurniawan	Characterization and Application of Bayah Natural Zeolites for Ammonium Capture: Isotherm and Kinetic	UNTIRTA
27	FP	330	Wardalia	Peanuts Shell As a Color Adsorbent Of Methyl Violet	UNTIRTA
28	FP	335	Kusdianto	The effect of catalyst weight on the photocatalytic performance of ZnO-Ag nanocomposites prepared by flame	ITS
29	FP	342	Widya Ernayati Kosimaningrum	Preparation of Chitosan-Honey-Gelatin-Based Hydrogel for Potential Active Material of Wound Care Dressing Application	UNTIRTA
30	FP	349	Denni kartika Sari	Extraction Refined Carrageenan Using Ultrasonic Iiridiation From Kappahycus Alvarezi Originated From Lontar	UNTIRTA

31	FP 351	Medyan Riza	Biodegradable Plastic Production Optimization Using Response Surface Methodology	UNSYIAH
32	FP 370	Lucky Wahyu Nuzulia Setyaningsih	Cellulose Extracted from Water Hyacinth and The Application in Hydrogel	UII
33	FP 389	Dhena Ria Barleany	Utilizing Alginate to Improve Elasticity and Moisture Balance of Polyvinyl Alcohol/Chitosan Hydrogel Wound Dressing	UNTIRTA
34	FP 407	Nyoman Puspa	Transesterification of kapok seed oil (Ceiba pentranda) using heterogeneous catalyst bimetallic oxide of zinc and copper supported by γ-alumina	UNIPRA
35	FP 418	Yeyen Maryani	Sensors and Mini Photocatalytic Reactor as a Tool for Measure CO2 Gas from the Degradation of the Detergent Active Compound	UNTIRTA
36	FP 420	Nufus Kanani	Synthesis and characterization of PLA-CNC matrix for antidiabetic drug delivery applications	UNTIRTA
37	FP 422	Anton Irawan	Fuel Oil Production from Thermal Pyrolysis of Packaging Plastic	UNTIRTA
38	ABS235	NLG Ratna Juliasih	Exploitation of Biosilica from Tropical Marine Diatom Cyclotella striata	UNILA

CIVIL ENGINEERING

No	ID	Name	Title	Univ
1	FP 116	Gunawan Saroji	Optimization of Income Property Base on Transit Oriented Development Using Hedonic Price Modelling	UI
2	FP 157	Dwi Novi Setiawati	Analysis of Characteristics and Needs of Parking on Sudimara Station of South Tangerang	UNTIRTA
3	FP 162	Zulmahdi Darwis	The Influence of The Use of Horizontal Pegs at Distance of 15 cm to The Shear Strength of The Laminated Bamboo Beam Based On Type of Adhesive	UNTIRTA
4	FP 163	Zulmahdi Darwis	Comparison on Reinforced Concrete Bar Strengthening using CFRP Method, The IWF Bar Support Addition, and Bar Dimension Enlargement	UNTIRTA
5	FP 174	Muhammad Ichsan	Emission Study: estimation and optimization of the voyage Energy Efficiency Operational Indicator (EEOI) on Indonesia Sea Toll-Way corridors	Universität Duisburg-Essen
6	FP 187	Erizka Ramdhiani	The Effect of Mixing Peatland Burning Remains as Fly Ash and Peat Soil on Its California Bearing Ratio Value	UI
7	FP 192	Atmy Verani Rouly Sihombing	Bio-asphalt on Asphalt Mixture containing RAP	ITB
8	FP 212	Samuel Henrina Sundjaja	Comparisons of Direct SPT Methods for Calculating Axial Capacity of Piles in Jakarta Areas	UI
9	FP 213	Rindu Twidi Bethary	Aging Effect Condition on Hot Asphalt Mixtures Marshall (AC-BC) Performance by Using Slag	ITB
10	FP 217	Farah Ayu Ridhani	Application Of Direct Method Cone Penetration Test In Jakarta	UI

11	FP	221	Demarda Kalimanto	Impact of road rehabilitation zone on travel time to road user cost	UI
12	FP	231	Nyoman Budiartha Raka Mandi	The Assessment and Management of Cruise Port for Tourism Destination Development in Bali Island	UNUD
13	FP	243	Bella Fauziah	Performance Evaluation Of Bus Rapid Transit (Brt) Trans Kota Tangerang Service	Kajian Pengembangan
14	FP	269	Bagus Eratodi	Moment Resistance Curve of Laminated Bamboo Connection With Various Plate Connector Under Monotonic Loading	UNDIKNAS
15	FP	277	Ghefra Gaffara	Smart Infrastructure Application in the Development of Indonesia Economic Corridor	UI
16	FP	278	Ghefra Gaffara	Dumai Seatropolis: Port City Approach Implementation	UI
17	FP	281	Dadang Iskandar	Investigation of The Correlation between Drainage Condition and Pavement Performance	UI
18	FP	293	Soelarso	On the finite element bearing capacity analysis of a rib system to be used as shallow foundation construction	UTC
19	FP	296	Enden Mina	UTILIZATION OF SLAG AND FLY ASH FOR SOIL STABILIZATION AND THE THEIR EFFECT TO CALIFORNIA BEARING RATIO (CBR) VALUE	Universitas Sultan Ageng Tirtayasa
20	FP	299	I WAYAN SUTAPA	Study Flood Routing Mamak Dam and Evaluate the River Mamak to Convey the Flood Design, Lombok, Indonesia	UNTAD
21	FP	310	Hendrian Budi Bagus Kuncoro	Experimental Study Of Variation Of Models And Layers In Bamboo's Perpendicular Connection To Fiber With Fiber-Reinforced Polymer (FRP)	UNTIRTA
22	FP	311	Dwi Esti Intari	PERFORMANCE OF ASPHALT MIXTURE (AC-WC) USING THE RICE HUSK ASH AS ADDITIVE ON ASPHALT	UNTIRTA
23	FP	316	Woelandari Fathonah	Stabilization of Clay Using Slag and Fly Ash with Reference to UCT Value (Case Study : Jalan Kadusentar, Pandeglang District – Banten)	UNTIRTA
24	FP	323	Yoshi Dessiani	A Study of Apartments Management in Taman Rasuna Apartments and Kalibata City Apartments, South Jakarta based on the DKI Jakarta Governor Regulation Number 132 Year 2018 concerning in the Management of Owned Apartments	UI
25	FP	344	Rifky Ujianto	DESIGN OF A COASTLINE TOURISM AREA AS A PUBLIC SPACE Case Study: Carita Beach, Pandeglang - Banten	UNTIRTA
26	FP	352	Muhammad Fakhruriza Pradana	A Systematic Literature Review on Maritime Transportation Optimization Using Linear Programming	University of Duisburg Essen
27	FP	368	Rama Indera Kusuma	CLAY STABILIZATION USING FLYASH AND CARBIDE WASTE AND ITS EFFECT ON THE VALUE OF UNCONFINED COMPRESSION TEST (Case Study of National Park Ujung Kulon Road in Pandeglang Regency)	UNTIRTA
28	FP	369	Andi M	Correlation of Reinforced Concrete Quality Based on Variations in UPV Testing Methods	UNTIRTA
29	FP	375	Restu Wigati	Capacity and Performance Evaluation of the Drainage System Jati Pinggir -Petamburan Central Jakarta	UNTIRTA
30	FP	376	Naniek Utami Handayani	The Driver and Barrier of Implementation Green Supply Chain Management (GSCM) in Construction Projects: A Literature Review	UNDIP

31	FP	391	Desy Widya Astuti	TRAVEL BEHAVIOR OF COMMUTER LINE PASSENGER TO STATIONS IN DEPOK CITY	UI
32	FP	411	Bambang Winarta	Numerical Study on Transition to Turbulent Flow beneath Solitary Wave	UNIBRAW
33	FP	413	Baehaki	Experimental Study of Crack Depth Measurement of Concrete with Ultrasonic Pulse Velocity (UPV)	UNTIRTA
34	FP	425	Wibowo		UNDIP

ELECTRICAL ENGINEERING

No	ID	Name	Title	Univ
1	FP 12	Eva Novianti	DEVELOPMENT WEDDING PLANNER USING EXTREME PROGRAMMING METHOD	Dharma Persada Univ
2	FP 17	Lily Puspa Dewi	Development of an Android document management	UK Petra
3	FP 37	Supriyanto Praptodiyono	Experimental Evaluation of Real-Time Packets Transmission during Vertical Handover Process on Mobile IPv6	UNTIRTA
4	FP 139	Rocky Alfanz	Integrated Micro Tesla Magnetic Sensor for Detecting Photovoltaic Cells Failure	Kumamoto University
5	FP 165	Agusutrisno	Development of Guide Stick Navigation For Blind Person Using Digital Compass and Global Positioning System	UNTIRTA
6	FP 194	M. Agus Budi	Study of Voltage Stability on Photovoltaic Integration into Mandalika Lombok Distribution System	UI
7	FP 211	Cakra Adipura Wicaksana	Comparison of Acceleration Python Library on Design and Implementation of QRS Detection Module from ECG Heart Signal	UNTIRTA
8	FP 229	Fahmi Muhyiddin	Overload Handling of Paiton IBT Using Load and Capacitor Shedding of Bali Subsystem	UI
9	FP 270	Romi Wiryadinata	Design of Linked Sirene for Tsunami Early Warning System Using Telecontrol System (Case Study at PUSDALOPS PB BPBD of Cilegon City)	UNTIRTA
10	FP 320	Ahmad Shulhany	MONOCHROMATIC AND RAINBOW 4-CONNECTIVITY OF SOME SPECIAL GRAPHS	UNTIRTA
11	FP 333	Dwi Riana Aryani	Simulation of Stand-Alone Floating PV and Battery Systems	UI
12	FP 350	Umar Fitra Ramadhan	Influence of Shading to The Output Power of Photovoltaic in Indonesia as a Tropical Country	UI
13	FP 353	Nurian Satya Wardana	Design of Direct Load Control Device and Its Effect on Load Reduction	UI
14	FP 357	Syarif Abdullah	Thinning process algorithms for compound Poisson process having nonhomogeneous Poisson process (NHPP) intensity functions	UNTIRTA

15	FP	364	Masjudin	Text Editor Application to Automate the Format of Writing a Final Project Based on Java Programs	UNTIRTA
16	FP	367	Fadil Muhammad	Chacha Stream Cipher Implementation For Network Security in Wireless Sensor Network (WSN)	UNTIRTA
17	FP	374	Irma SaraswatiIrma Saraswati	Increasing Web Server Performance Using the Web Balancing Method	UNTIRTA
18	FP	378	Haidar Ali	Voltage Profile Improvement Analysis during the Loss of Transmission Lines on 150kV Subsystem using Static	UI
19	FP	381	Faiz Husnayain	Synchronous Compensator Analysis of UPFC implementation for optimizing power flow & improving power system stability in Z power system	UI
20	FP	385	Bagus Chandra	Transient stability improvement by FACTS devices: A	UI
21	FP	397	HERI HARYANTO	Design of Monitoring System For Drying and Storage of Shallots	UNTIRTA
22	FP	400	Albert Gunadhi,	Microcontroller-based assistive device for training weak biceps brachii muscle	UWM
23	FP	410	Wahyuni Martiningsih	Design of Wireless Power Transfer using Flyback Converter and Tesla Coils	UNTIRTA
24	FP	416	Muhammad Iman Santoso	Development of the WebGIS Application for Transport Infrastructure Management in the City of Serang	UNTIRTA

MECHANICAL ENGINEERING

No	ID	Name	Title	Univ
1	FP 24	Eui Soo Kim	Evaluation on Rupture Characteristics of CNG Vehicle Container by Heat Treatment using AUTODYN	KNUT
2	FP 25	Bambang Iskandriawan	Air Purifier Bike Design and Prototype as A Short Distance Transportation Plus An Effort to Downgrade The Level of Air Pollution Concentration in Towns	ITS
3	FP 33	Syaiful	2-D Modelling of Interaction between Free-Stream Turbulence and Trailing Edge Vortex	UNDIP
4	FP 82	Wayan Widhiada	Comparison of the Performance of Robotic Prosthetic Limbs Motion using PID and Fuzzy Logic Control System	UNUD
5	FP 107	Husaini	Failure Analysis in the Pipe of Heat Recovery Steam Boiler Generator (HRSG) at the Gas Refinery	UNSYIAH
6	FP 108	Husaini	FAILURE ANALYSIS IN A CRANKSHAFT PULLEY TRUCK HEAVY DUTY	UNSYIAH
7	FP 129	Muhammad Haekal Habibie	Using Decision Rule in Calibration of Long Gauge Block on The Conformity Assessment Scheme	BSN
8	FP 168	Yafid Effendi	Heat Transfer And Pressure Loss Analysis Of Air Flow Through Heated Cylinders With Concave Delta Winglet Vortex Generators In Rectangular Channel: An Experimental Study	UNDIP

9	FP	186	N Nazaruddin	Electric Power Steering: Overview of Matematical Model and How Its Difference for Large Vehicle	UI
10	FP	193	Bambang Iskandriawan	Thermal Simulation and Cooling Load Analysis In The Apartment Unit Throughout Building Construction Elevation	ITS
11	FP	250	Hans Thiery Tjong	Bicycle Stability Control to Assist Amateur Riders based on Newton Central of Gravity	UI
12	FP	272	Romi Wiryadinata	Data Acquisition for Steel Defect Detection Using Continuous Wavelet Transform	UNTIRTA
13	FP	292	Nazaruddin Sinaga	Numerical Analysis of the Effect of Free Stream Turbulence Intensity on the Aerodynamic Performance of Wind Turbine Airfoils NACA 4415	UNDIP
14	FP	298	Jamila Rahmoun	Investigation on the Micromechanical Modeling of Ductile Fracture of Human Humerus	Polytechnic University Hauts-de-France
15	FP	302	Hendriko	Analytical Cut Geometry Calculation for Multi-Pass Rough Milling of a Free Form Surface Machining	Politeknik Caltex Riau
16	FP	303	Teuku Edisah Putra	Locating Damaging Segments in the Acceleration Signal of an Automotive Coil Spring Using the Wavelet Transform	UNSYIAH
17	FP	304	Teuku Edisah Putra	Automotive Suspension Component Behaviors Driven on Flat and Rough Road Surfaces	UNSYIAH
18	FP	305	Agung Sudrajat	DIAMETER CHARACTERISTICS OF PARTICULATE MATTER INDOOR AIR POLLUTION IN FOOD STORAGE BY ELECTROSTATIC PRECIPITATOR	UNTIRTA
19	FP	314	Ni ketut caturwati	Myristic Acid as Phase Change Material (PCM) for Increased Productivity of Solar distillation plant	UNTIRTA
20	FP	343	Dwinanto Sukamto	Improved value of temperature different on the hotbox for thermal tests	INSA de Strasbourg, France
21	FP	356	Dharmanto	Comparison of Porosity, Oxygen and Carbon Concentration in Stainless Steel Powder Particle using Gas Atomization and	UI
22	FP	361	Imron Rosyadi	Conduit Plasma AtomizationPerformance Study And Emission Of Exhaust Gas Single Cylinder Diesel Engine Based On Fuel	UNTIRTA
23	FP	371	Erwin	Bioetanol - Solar Using Fumigation And Blending MethodsReduces blade shaft deflection with improved mount design to increase vertical hybrid wind turbine performance	UNTIRTA
24	FP	372	Iman Saefuloh	THE EXPERIMENT OF CORROSION CHARACTERISTIC, HARDNESS AND MICRO STRUCTURE OF API 5L STEEL USING NATRIUM CHLORIDA CORROSIVE MEDIA WITH NATRIUM ACETAT AND	UNTIRTA
25	FP	382	Agus Pramono	Comparison of Mechanical Properties on High Strength of Aluminum by Several of Severe Plastic Deformation (SPD) Methods	UNTIRTA
26	FP	384	Sidik Susilo	Mathemathical modeling on electromagnetic energy harvesting from vehicle suspension system	UNTIRTA
27	FP	388	Arif Prasetya Kurniawan	Composite Hybrid Made From Corn Skin Fiber, Banana Midrib Fiber and Recycled Polyethylene Terephthalate Plastic	UMS
28	FP	396	Erny Listijorini	Risk Husk Gassification Performance to Decrease Water Content in Liquid Palm Sugar	UNTIRTA

29	FP	402	Agung Setyo Darmawan	Effect of FeSiMg addition in nodular cast iron on strength and toughness	UMS
30	FP	404	Tjahjanti	Study on the Making of Corrosion Resistant Steel (ASTM A36 Steel) Coatings from a Mix of Graphene Oxide+Waterborne Paint	UMS
31	FP	408	Muhammad Syahid	Effect of Pouring Temperature on Mechanical Properties and Microstructures of Aluminium Matrix Composite Strengthened by CNT with Stir Casting Method	UNHAS
32	FP	414	Rina Lusiani	Effect Of Air Fuel Ratio (AFR) On Performance of Gasification Machine TG30-1 Using Water Boiling Test Method On Wooden Powder Biomass	UNTIRTA
33	FP	417	Dhimas Satria	Analysis Of Alpha Type Striling Machine Best Design Selection; Innovation Of Biomass Based Design	UNTIRTA

METALLURGICAL & MATERIAL SCIENCE

No	ID	Name	Title	Univ
1	FP 8	Lutfy Faluthi Firdaus	Failure Analysis of Tube Reboiler Sour Water Stripper Heat Exchanger in Refinery Industry	UI
2	FP 15	DNK Putra Negara	The Study on Mechanical Properties of Pack Carburized Low Carbon Steel Using BaCO3 as Energizer	UNUD
3	FP 21	ERLINA YUSTANTI	Fabrication of Fluorine Tin Oxide Conductive Glass Using Local SnCl4 Precursor Dopant Fluorine With Spin Coating Method	UNTIRTA
4	FP 61	Klodian Dhoska	Analysis of Recycled Tire Rubber Modified Bitumen in Albania for Quality of the Road Construction	Polytechnic University of
5	FP 120	Sugeng Slamet	Forging process on gamelan bar tin bronze Cu-25wt.%Sn post casting deformation to changes in microstructure, density, hardness, and acoustic properties	UGM
6	FP 121	Galih Senopati	Microstructure, Mechanical Properties, and Corrosion Resistance of Ti-6Mo-6Nb-xSn Alloys for Biomedical Application	UI
7	FP 124	DNK Putra Negara	Development and Characterization of Activated Carbons Derived from Lignocellulosic Material	UNUD
8	FP 147	Tri Partuti	Effect Of Activation Time The Chicken Feather Activated Carbon On Surface Area Of Pores: Candidate For Hydrogen Storage Application	UNTIRTA
9	FP 164	Ferriawan Yudhanto	Physical and Mechanical Characterization of Polyvinyl Alcohol Nanocomposite Made from Cellulose Nanofibers	UGM
10	FP 178	Bening Nurul Hidayah Kambuna	Effect of temperature on metal phase changes and particle growth results from reduction of ferronickel dust pellet	UNTIRTA
11	FP 191	Amalia Sholehah	Evaluating the Effect of ZnO Stucture on Electrical Properties using Capacitive Sensor	UNTIRTA
12	FP 209	Abdul Aziz Faisal	Characterization of Aluminum Composite Material with Variations of Silicon Nitride Reinforcement Volumes through a Stir Casting Process	UI
13	FP 219	MUHARAM KEMAL ADAM	Characterization of Aluminum Composite Material with Variations of Silicon Nitride Reinforcement Volumes through a Stir Casting Process	UI

14	FP	220	Fachri Munad	Activated Carbon Production Through Co-Pyrolysis of Vacuum Residue and Dehydrated Castor Oil	UI
15	FP	226	Tuti Nur Fitri	The Effect of Nano SiC to AC4B Alloy through a Stir Casting Process	UI
16	FP	230	Didied Haryono	MONITORING COLUMN FLOTATION PROCESS OF SULFIDE ORE USING ELECTRICAL CAPACITANCE VOLUME TOMOGRAPHY (ECVT) WITH PARTICLE SIZE AND AIR FLOW RATE VARIATION	UNTIRTA
17	FP	240	Callista Fatima Larasati	Study of the Influence of Voltage Variation on Electrolytic Plasma Process on Ti-6Al-4V Surface Characteristics for Orthopaedic Implant Applications	UI
18	FP	241	Rizkijanuar Ramadhan S	The Role of Etching Surface Treatment of Ti6Al4V Alloys on Hydroxyapatite Coating on Substrate Surfaces by Electrophoretic Coating Method	UI
19	FP	255	Daisman Purnomo Bay	Tool-Narayanaswamy-Moynihan Simulation on Crystallized Zr60Cu25Ni5Al10 Amorphous Alloy	USAKTI
20	FP	260	Davino Aditya Dwinanda	THE EFFECT OF SILICA FUSED ADDITION AS FILLER ON ZIRCON BASED REFRACTORY COATING	UI
21	FP	263	Muhammad Rifai	Effect of Stored Energy on Corrosion Fatigue Properties of Ultrafine Grained Fe-20%Cr Steel by Equal Channel Angular Pressing	BATAN
22	FP	264	Muhammad Rifai	Morphology and Physicochemical Properties and the Gelation Process of Ceria Stabilized Zirconia as Surrogate Material of High-Temperature Reactor Fuels	BATAN
23	FP	286	Gatot Trimulyadi Rekso	Synthesis of Ag nano-chitosan in latic acid solvent by irradiation method	BATAN
24	FP	287	Soesaptri Oediyani	Optimization of flotation columns to provide added value of local sphalerite ore	UNTIRTA
25	FP	319	Adinda Dita Dwi Lestari	the Characteristics of Aluminum AC4B Composites Reinforced by the Fraction Volume Variations of Boron Carbide Through the Stir Casting Process	UI
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KEYNOTE SPEAKER ABSTRACT

Production of high-performance nanostructured materials using severe plastic deformation

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Abstract

The process of severe plastic deformation (SPD) is gaining popularity because it can provide microstructure control of metallic materials including grain refinement to the submicrometer and/or nanometer range, reduction in the size and distribution of second phase particles, supersaturation of alloying elements, consolidation of powders, and stress- and/or strain-induced phase transformation in bulk metallic materials [1]. When the SPD process is performed under high pressure, its applicability is extended to materials with high-strength and less-ductility such as intermetallics [2], ceramics [3] and semiconductors [4]. The process of high-pressure torsion (HPT) is a typical SPD process under high pressure [5]. Recently, a new process called high-pressure sliding (HPS) was developed [6], which also allows SPD under high pressure and have potential for upscaling [7]. In this opportunity, we introduce our recent results after processing by HPT and HPS. The results include high tensile strength of aluminum alloys [8], superplasticity of a Ni-based superalloy [9], hydrogen production from ceramics [10] and synthesis of intermetallics such as FeNi [11]. It is shown that the microstructural control was feasible because of an enhanced diffusion due to a high density of lattice defects [12] and/or phase transformation under high pressure [10].

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The Role of Chemical Engineering in Green Vehicle

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Abstract

The transportation sector is a major contributor to greenhouse gas emissions. For example, it is estimated that this sector is responsible for more than 10% of global CO_2 emissions (more than 20% in Europe). About 90% of the sector's CO_2 emissions are attributed to road transport, *i.e.* light vehicles and heavy goods vehicles. It is also important to mention that, despite the significant progress made in recent decades in the area of car pollution, the volume of CO_2 emitted by the sector is constantly increasing. This is mainly due the increase of the vehicle fleet. For example, the global fleet of light vehicles is expected to double by 2050 to exceed the 2 billion mark. This increase is due to several factors, the most important of which are the need for mobility, growing demographic trends, favorable economic elements (affordable prices, purchasing power) as well as social factors (paid leave, free time, comfort, etc.).

In addition, we might take account of indirect emissions, known as "grey emissions", which are produced during the fabrication of cars, fuels and roads as well as for recycling of associated wastes. To illustrate this, we should consider that a car requires on average 30 tons of raw materials during its construction. These raw materials are extracted from the soil, transported and processed, which are highly CO_2-emitting activities. From these raw materials, spare parts are manufactured using industrial processes that still produce CO_2. These parts are then also transported, sometimes to the other end of the world, to be assembled in the car manufacturing factories. Finally, the assembly and the final transport of the vehicles again produce CO_2. Also, the fuel (gasoline or diesel) used by the car undergoes a whole set of transformations since the extraction of the crude oil until the refining by passing by the transport and all these steps are polluting as well. It is the same for the infrastructural constructions (roads, parkings, etc.). In general, "It is estimated that the grey CO_2 emissions are equivalent to 70% of direct emissions.

However, important technological advances have been made in recent decades to significantly reduce emissions, not only of CO_2, but of other significant compounds such as Particulate Matter (PM) and NOx (both being more harmful than CO_2). For example, Figure 1 shows the European regulations with their corresponding imposed limits for NOx-PM trade-off with diesel engines [1].

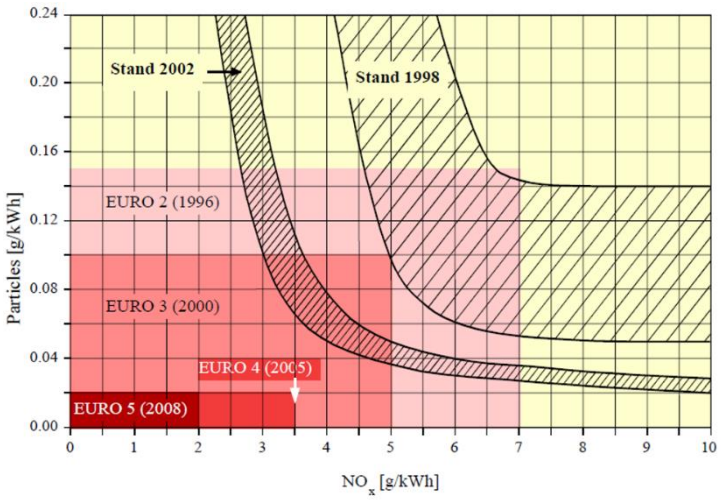

Figure 1. NOx-PM trade-off with diesel engines imposed by European regulations [1].

In this context, chemical engineering has played a leading role and has been able to propose innovative solutions, both in terms of reducing grey emissions and in terms of reducing direct emissions by setting up more efficient engines and/or fuels or embedded systems for post-treatment of gases.

The subject of this presentation is to give an overview of the role of chemical engineering and, in particular, of powder science and technology in recent advances in clean car manufacturing. After setting the global context and main challenges, the various levers of action for the development of cleaner cars are presented. Three examples of representative research projects are then presented:

- development of powder paints for the reduction of grey emissions [2],
- the solid storage of ammonia for the post-treatment of exhaust gases,
- the hydrogen storage as an alternative fuel [3]

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Maximizing the efficiency of CMOS front-illuminated photovoltaic for self-powered sensor applications

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Abstract

There is a tremendous need for sensors to accommodate the booming markets for IoT, Industry 4.0, intelligent building, environmental monitoring, home security and care, health care system and even implanted electronic medicine. One of the major challenges is to power such enormous sensors in an efficient and inexpensive way. Either wired or wireless power supply is not only money- but also time-wasting for outdoor applications. Energy harvestings become popular and viable solutions to compose the so-called self-power sensors. Among them, on-chip solar cell gets much more attention than the others due to its readiness and easiness to access.

To get high conversion efficiency, back-illuminated solar cell can be adopted. However, it requires expensive non-standard processing such as substrate thinning, substrate removal, surface texturing and Integrated Passive Devices (IPD) flip-chip packaging. To be fully integrated with the standard CMOS circuits, front-illuminated solar cell is a much better alternative at the expense of lower efficiency due to the shielding effect of metal lines for photocurrent conduction. Different CMOS layers and layout topologies are explored to increase the PN junction depletion region density per area and the corresponding aperture ratio to enhance the conversion efficiency. The photovoltaic chips from a few batches and processes are measured and compared. Some easy-to-understand rules are summarized to maximize the output power of front-illuminated CMOS solar cell. With the standard TSMC 0.18μm CMOS process, a record-breaking 31.5% conversion efficiency is finally achieved.

Key preparations for industry 4.0: technologies, business, education, attitude

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Abstract

Industry 4.0 is characterized by digitalization, interconnection, and intelligence. These characteristics correspond to technologies such as internet of things, cloud computing, big data, artificial intelligence, augmented reality and virtual reality. The application of those technologies in industry can cause disruptions. The talk will highlight the methods to prepare individuals and organizations for industry 4.0 so that they will not be disrupted. The methods focus on four dimensions, i.e. technologies, business, education, and attitude. Data driven service is considered as a new business model in industry 4.0, which uses technologies to create smart products, services, and infrastructures. The education emphasizes the interdisciplinary, IT contents, and creativity. Individuals and organization should have life-long learning, adaptive, swarm leadership, and capabilities to collaborate with people from different backgrounds.

Recent advances in particle methods for the modeling of computational mechanics problems

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Abstract

This paper summarizes some recent developments on particle methods [1] made during the last few years. Three numerical techniques namely: the Smoothed Particle Hydrodynamics (SPH), the Peridynamics Method (PM) and the Lattice-Boltzmann Method (LBM), have been investigated by reformulating and adapting them for the e_cient modeling of thin structures such as beam, plates and shells [2, 3, 4] . This investigation gives an overview of the three techniques when applied for solving a class of computational mechanics problems involving, thin composite structures undergoing severe loading, structures including discontinuities, as well as the uid-structure coupling for biomechanics applications.

The Finite Element (FE) method is the most widespread numerical technique for the simulation of multi-physics engineering problems, it has gained maturity and has led to robust commercial softwares such as Abaqus, Ansys, Ls-Dyna, etc. Nevertheless, the need of a good element quality during the simulation, can pose an issue in solving complex problems, involving large deformations or imperfections such as cracks or moving interfaces in hybrid assemblies. Particle methods [1] share a common feature that alleviates this issue because the state variable approximation is constructed based on scattered nodes without the need of element support. The development and the extension of the SPH method for the analysis of isotropic and multilayered composite shell structures, undergoing severe loading have been undertaken [4]. Major defects of the classical SPH method such as the lack of consistency, the tensile instability were solved by\Corrective Smoothed Particle Method", the use of the \Total Lagrangian Formulation" and \arti_cial viscosity". Mindlin-Reissner Theory was employed for the modeling of thick shells, by using only one layer of particles in the mid-plane. The strong form of the governing equations for shell structures were discretized directly by the modi_ed SPH method and solved using the explicit time integration scheme. An extension of the method has been introduced for the modeling of low-velocity impact of shells by rigid projectiles with the integration of Tsai-Wu failure criterion for the modeling of progressive degradation of multilayered structures [4]. Further improvements of the shell-SPH method are still carried out and some new extensions are introduced [1].

The Peridynamic Method (PM) was founded on the Bond-Based Peridynamics theory for the numerical modeling of isotropic and composite thin structures undergoing dynamic transient loadings [2]. Our developments have been focused mainly on exploring the possibilities o_ered by the PM, which has been widely applied in various engineering domains where strong or weak discontinuities may occur such as cracks or heterogeneous media. The originality and major

interest of this work has been the extension of the PM to make it e_ective for the modeling of thin isotropic and laminated composite structures under dynamic loadings. This topic is original since, based to our knowledge; it has not been addressed so far in any research publication. New developments have been undertaken, concerning the extension of the standard PM to the modeling of Timoshenko beam and Reissner-Mindlin plate structures with a wide range of thickness to length ratios [2].

The development of a new technique for the modeling of FSI problems using only particle methods [3]. This research work was in the continuity of the biomechanics research team works at the Polytechnic University of Hauts-de-France in Valenciennes, regarding the understanding of the trabecular bone behavior in its physical environment of marrow. Here, the SPH method was used for the bone-lamellas modeling, supposed in a first attempt as a fragile elastic solid. The Lattice-Boltzmann method (LBM) was developed for the marrow ow modeling considered as a viscous incompressible liquid. Following a literature review of FSI coupling techniques, a partitioned approach in time was chosen, allowing the use of a co-simulation of two separates codes, both based on a dynamic explicit algorithm resolution scheme. The special search for the wet surfaces was done based on a specific technique of immersed boundary method, this technique is very e_cient because it does not require an additional domain discretization. The coupling approach developed was applied on academic benchmarks and on a biomechanical application, leading to good numerical results and a strong stability of the FSI iterative procedure [3]. Several problems have been solved using the above mentioned particle methods. The _rst two applications dealing with the analysis of a composite plate made of T300/934 carbon-epoxy and the damage of a graphite/bismalemide square plate, both impacted by rigid projectiles [4].

The peridynamics application deals with the stretching of a diagonal square plate made of a brittle polymer Plexiglas and including a central crack [2]. The crack orientation angle was studied and its propagation compared to the experiment. The last application dealing with the prediction of the trabecular bone behavior of a porcine femoral neck including the marrow e_ects when subjected to dynamic compression loading. This is a Fluid Structure application, where a cubic sample of trabecular bone with its marrow was extracted from a porcine femoral neck, then was scanned using a micro-CT scan; the reconstruction of the 3D geometry was performed based on the digitalized STL geometry. Then, a 3D discretization of particles for the bone and the marrow was generated. The efects of marrow on the global behavior of the trabecular bone was studied and compared to conventional techniques.

Nowadays, particles techniques are available such as the SPH, the PM, the LBM among others. They are becoming a real alternative for solving a variety of multiphysics problems involving structures undergoing severe loadings.

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Fouling control in membrane processes for sustainable operation: module development approach

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Abstract

Water scarcity and poor access to clean water and sanitation are two of the most pervasive world problems. Addressing these problems requires effective research on optimizing the state-of-the-art technologies or developing robust new technologies and materials for purifying water at lower cost and with less energy, low chemical foot-print and low environmental impact. One of the most promising technological solutions to anticipate those problems is by implementing membrane-based processes. Membrane technology has long been the established solution, but still require further development to improve its effectiveness and efficiency. However, the problem of membrane fouling remains troublesome in almost all membrane-based processes: it limits the achievable productivity, reduces the operational sustainability, reduces the lifetime of the membrane, etc. As a result, it increases the investment and operational costs. In this talk, I will be presenting a general overview on membrane fouling management research and focus on techniques to manage membrane fouling in module development approach/perspective.

CHEMICAL ENGINEERING

Effect of two stages adsorption as pre-treatment of natural organic matter removal in ultrafiltration process for peat water treatment

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Abstract

Natural Organic Matter (NOM) content in peat water is a major problem of membrane fouling in ultrafiltration (UF). For that, two stages adsorption as pre-treatment was employed to minimize the membrane fouling of NOM content. This research were carried out to investigate the effect of two stages adsorption on ultrafiltration performance for NOM removal that remains in peat water. This method was using powdered activated carbon (PAC) dosage of 80, 160, 240, 320, 400, 480, 560, 640, 720, 800, 880 dan 960 mg L^{-1}. Then, Polysulfone (Psf) material was employed for Ultra filtration process. Membrane was applied in a dead-end mode with various operating pressure (1; 1.5; 2; 2.5; 3 bar). As a results, the optimum dose of PAC was 800 mg L^{-1} with dosage ratio of 0.75:0.25. Two stages adsorption-UF PSf provided the range from 86.9 to 92.8% of $KMnO_4$ and 74.1-88.1% of UV_{254}. For the experimental condition of 3 bar, the highest flux was achieved up to 39.919 L h^{-1} m^{-2}.

Hydrogen sulfide separation from biogas using laterite soil adsorbent

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Abstract

Biogas production contributes as an alternative renewable energy but its emissions contain hydrogen sulfide which needs to be separated because it can cause damage to the environment. The method used in separation is adsorption with laterite soil because the price is cheap, easy to obtain, and can occur at room temperature. The purpose of this study is to determine the condition of the adsorbent in the adsorption column which can provide a high adsorption capacity. The separation process is carried out by flowing biogas with a flow rate of 1.5 liters/minute to the adsorption column containing laterite soil. Reducing the particle size of the adsorbent from 6 mesh to 21 mesh will increase the adsorption capacity to 2.13 times, ie from 7.30 to 14.22 mg H2S/g adsorbent. The addition of bed height from 7 cm to 12 cm will increase the adsorption capacity from 6.69 to 7.92 mg H2S/g adsorbent at 6 mesh particle size. The addition of bed height from 7 cm to 12 cm will increase the adsorption capacity from 13.48 to 14.96 mg H2S/g adsorbent at 21 mesh particle size. The laterite soil adsorbent with a particle size of 21 mesh has the highest adsorption capacity of 14.96 mg H2S/g adsorbent.

Techno-economic evaluation of nitrocellulose production from palm oil empty fruit bunches

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Abstract

Nitrocellulose is a cellulose derivative that has many potential applications. Nitrocellulose can be made through nitration reactions by reacting cellulose and nitric acid at low temperatures. Cellulose can be obtained from lignocellulose biomass such as palm oil empty fruit bunches (POEFBs). In this study, techno-economic evaluation of nitrocellulose production from POEFBs was investigated with various types of alkaline and acid pretreatments. Pretreatment of POEFBs with alkaline and acid was used to purify cellulose fraction as raw material for nitrocellulose. The combination process of POEFBs pretreatment with alkaline and acid can be classified into 4 process routes such as ammonium hydroxide and sulfuric acid pretreatment (Route-1), ammonium hydroxide and acetic acid pretreatment (Route-2), sodium hydroxide and sulfuric acid pretreatment (Route-3), and sodium hydroxide and acetic acid pretreatment (Route-4). The results showed that ammonium hydroxide and sulfuric acid pretreatment (Route-1) was the most profitable route to produce nitrocellulose. Economic parameter values such as return of investment (ROI), payback period (PBP), net present value (NPV) and internal rate of return (IRR) from ammonium hydroxide and sulfuric acid pretreatment (Route-1) were 11.49%, 5.85 years, US$ 442,427 and 13.35%.

Activated carbon production by co-pyrolysis of vacuum residue and gum rosin

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Abstract

Vacuum residue (VR) is potential to be used as a feedstock for mesophase pitch (MP) production because of its low cost and aromatic content. MP, which is a liquid-crystalline state of VR, may be used as precursor of activated carbon (AC). Gum rosin containing conjugated double bonds may be added to and can improve crystallinity and pore surface area in further processes of carbonisation and activation. In the present study, co-pyrolysis was carried out in a stirred tank reactor at 450°C with holding time for 120 minutes. The amount of gum rosin mixed with VR was varied 0, 5, 10 and 15% wt of VR. The precursor products had C/H mole ratio of about 2.43, 2.37, 2.28, and 2.01 by increasing gum rosin added. Subsequently, this precursor underwent carbonization at 700°C with holding time for 120 minutes under N_2 flow and activation. KOH solution was used as activating agent to the precursor of activated carbon. Activated carbon gave higher surface area and lower C/H atom ratio with increasing gum rosin added during co-pyrolysis. With gum rosin addition, surface areas of ACs were 120.81, 194.56, 312.36, dan 462.19 m^2/g, respectively, and crystallite sizes increased from 8 to 22 Å.

The effect of injection rate from a novel natural-oil based surfactant on the capillary number for reducing residual oil saturation

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Abstract

The application of surfactant flooding to increase the oil production has been widely known as an alternate to extract the trapped oil in the mature oilfield. The surfactant's ability for lowering the interfacial tension (IFT) of oil and water that increase the capillary number is the main mechanism in Enhanced Oil Recovery (EOR) methods to reduce the residual oil saturation. The effect of ultralow IFT of a novel natural oil-based surfactant to the residual oil saturation was investigated, whereas the effect of different flow rate during injection as one of CDC parameter was also assessed. Core flooding experiments were used as the main tools to evaluate the influence of IFT to the capillary number (Nc) that consequently affecting the residual oil saturation (Sor). The results showed that injecting ultralow IFT surfactant were able to increase oil recovery or lowering the residual oil saturation Oil saturated core was continuously injected with and without ultralow surfactant to analyze the effect of IFT to the residual oil saturation, whereas CDC profile was obtained by injecting ultralow IFT at different rate as one of the CDC parameter. The oil produce from the outlet of coreflood was collected and calculated to measure the total recovery of water or surfactant injection. CDC can then be generated by plotting the Nc with the Sor. The results showed that injecting ultralow IFT surfactant were able to increase oil recovery or lowering the residual oil saturation as much as 4%, whereas CDC's result showed that the residual oil saturation decrease with increasing Nc, with the optimum Nc to produce oil was at the level of 10^{-7}, rate 0.1 to 1.0 cc/min, increased 10^{4} from Nc at waterflood stage.

Characterizations of Ag doped ZnO nanoparticles via flame pyrolysis method for degradation of methylene blue

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Abstract

Flame pyrolysis is widely used for fabrication of nanoparticles due to high crystallinity and narrow size distribution of the products. In this study, ZnO-Ag nanoparticle materials have been successfully fabricated by flame pyrolysis. The effects of Ag loading ranging from 0 to 20 wt% on the photocatalytic activity of ZnO-Ag nanoparticle under UV and sunlight irradiations were studied. ZnO and Ag nanoparticles were synthesized based on zinc acetate dihydrate 0.1 M and silver nitrate as precursor inside a flame reactor. Morphology and crystallinity of ZnO-Ag nanoparticles were characterized by scanning electron microscopy (SEM) and X-ray diffraction (XRD), respectively. SEM analysis showed that the nanoparticles had irregular sphere-like shapes. The XRD patterns showed that the produced ZnO had a wurtzite structure with varying crystallite sizes. XRD analysis also confirmed the existence of Ag nanoparticles in ZnO-Ag nanoparticles after 5 wt% Ag was added. The existence of Ag was indicated by the appearance of XRD peak at 38.1º. The peak at 38.1º increased with the increase of Ag loading. Finally, the photocatalytic activity was evaluated by measuring the degradation of methylene blue aqueous solution under UV and sunlight irradiations. It showed that the best photocatalytic performance was obtained at 5 wt% Ag loading for both irradiations.

Hydrophobic modification of cellulose nanocrystals from bamboo shoots using rarasaponins

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Abstract

Due to its hydrophilic tendencies, the modification of cellulose nanocrystals (CNCs) is needed for applying in hydrophobic drug delivery system. The CNCs are chosen as a potential drug carrier because they are safe for consumption and cannot be digested by humans. Previous studies have investigated several modification agents, such as hexadecyltrimethylammonium (HDTMA) and cetyltrimethylammonium bromide (CTAB), to enhance the hydrophobicity of the CNCs. Natural surfactants, such as rarasaponins (RSs), are suitable to avoid the human health and environmental problems caused by the use of the previous modification agents. In this work, the RSs were attached to the surface of CNCs from bamboo shoots (BSs) by hydrogen bonds. The OH peak of the CNCs-RSs showed a higher level compared to the initial CNCs in the FTIR analysis. The initial concentration of RSs and the temperature were studied to obtain the best condition of the modification process among the variables studied. Both variables have significances toward the q as the response, where is proven by the p-value less than 5%. The highest amount of linked-RSs on the CNCs (q) as big as 203.81 ± 0.98 mg/g was obtained at a RSs initial concentration of 2000 ppm and a temperature of 30°C.

Characterization and application of Bayah natural zeolites for ammonium capture: isotherm and kinetic

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Abstract

The aim of this study is to characterize Bayah natural zeolites and tested for ammonium capture. Characterization of Bayah natural zeolites were performed by X-ray diffraction (XRD), scanning electron microscope (SEM), and nitrogen physisorption. The natural zeolites were identified as mordenite and clinoptilolite. Non-zeolitic phase appeared on the XRD pattern was quartz. The morphology of clinoptilolite and mordenite were observed as platy and needle shape in the SEM images, respectively. Major cations were K^+ and Ca^{2+} which were determined by energy dispersive X-ray. Nitrogen isotherm physisorption suggested that the natural zeolites was typical of type IV isotherm. Pore size distribution were determined using Barrett, Joyner, and Halenda model with mesopore size 3-5 nm. Ammonium exchange on Bayah natural zeolites were conducted in a batch experiment by varying the particle sizes, time and mass loading. Non-linear least squared method was applied to fit the experimental data with various kinetic and isotherm models. The kinetic data was well fitted with the Elovich equation with error 1.6×10^{-4}. Isotherm adsorption of ammonium followed Langmuir-Vageler with error 4×10^{-2}.

Effect of Different Types of Phosphorylating Reagent on the Synthesis of Modified Tapioca Starch

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Abstract

Tapioca starch is isolated from the root of cassava (Manihot esculenta) plant cultivated mainly in tropical areas of Asia, Africa, and America. Tapioca starch has very low residual impurities, bland flavor, and superior gel properties. Native and modified tapioca starch has been widely utilized for food applications. In this research, a preliminary study on the use of different types of phosphorylating reagents (Sodium Tripolyphosphate/ STPP, Sodium Trimetaphosphate/ STMP, and mixture of both reagents) on the synthesis of modified tapioca starch was performed. Phosphorylation of tapioca starch was performed at a temperature of 130 ^{o}C , initial suspension pH of 9, and an intake of STPP of 5 %-w/w and/ or STMP of 2 %-w/w based on dry starch. The experimental result shows that modified starch products with Degree of Substitution (DS) of 0.0084-0.0132 (correlated to P-content of 0.169-0.258 %-w/w) were obtained. The use of both STPP and STMP phosphorylating reagents gives starch products with increased solubility. Phosphorylation with all types of reagent also increases water and oil absorption capacity as well as paste clarity of tapioca starch. The result suggests that STPP and STMP are potential phosphorylating agents for modified tapioca starch preparation.

Calophyllolide separation from *calophyllum inophyllum* oil by silica gel adsorption and batchwise solvent extraction

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Abstract

Nyamplung (*Calophyllum inophyllum)* are widely spread in Indonesia and they are known to have many advantages. It has various benefits that can be utilized from root, stem, leaf, until seed. *C inophyllum's* seed contains bioactive compounds called calophyllolide. However, the utilization of *C. inphyllum's* seed is still limited because they contain harmful toxins. So, *C. inophyllum's seed* are generally used and investigated as a raw material of biodiesel. This research aimed to find the best condition to isolate calophyllolide, to know the yield of isolated calophyllolide and its purity percentage from crude *C inophyllum* oil. By far, the current research on calophyllolide is to extract the substance from *C. inophyllum's* shell nut without further treatment on the shell nut. In this work, calophyllolide was separated from crude oil by silica gel adsorption and batchwise solvent extraction by using a mixture of hexane as non-polar solvent and methanol-water (9:1) as polar solvent. Liquid Liquid Extraction (LLE) was performed to purify the calophyllolide from polar liquid fraction produced from batchwise solvent extraction by a mixture of hexane and ethyl acetate with solvent-PLF ratio 5:2. Ethyl acetate concentration in hexane used were 0%, 5%, and 9%. Each fraction obtained was tested qualitatively using Thin Layer Chromatography (TLC) and quantitatively using Gas Chromatography (GC) to analyze calophyllolide mixture. The best separation method was obtained by batchwise solvent extraction and 0% ethyl acetate with 63,9% purity level, 6,39% yield, and 75,63% recovery.

Effect of fermentation time on quality of modified gadung flour from gadung tuber (*dioscorea hispida dennst.)*

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Abstract

Gadung (*Dioscorea hispida Dennst.*) is one of the tubers in Indonesia that has the potential as a food source. However, due to the low nutritional value and high content of cyanide acid, these tubers cannot be consumed directly. Therefore, proper processing techniques are needed to improve the nutritional value of gadung tubers. The aim of this study was to investigate the effects of fermentation time on improving the quality of modified gadung flour in a reasonably short time. Before the fermentation process, pretreatment was performed to reduce levels of cyanide acid (161.83 ppm to 53.21 ppm). The fermentation time was performed for different periods of time (12, 24, and 36) with initial bacteria cell number of 1,21 x 10^{11} cells of *Lactobacillus plantarum*. The result showed that protein, cyanide acid, starch, amylose, amylopectin content was 7.63%, 6.66 ppm, 75.27%, 38.18%, 61.82%, respectively, while physicochemical properties such as swelling power water solubility, and flour whiteness degree was 6.75 g/g, 0.56%, and 71.43%.

Erosion rate prediction on the cyclones wall at coal boiler plant using computational fluid dynamics

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Abstract

In the coal boiler industry, cyclone is used to separate silica sands (as a fluidizing medium) from combustion gas from furnace. A gas-solid separation system with turbulent swirling flow that occurs in the cyclone will cause erosion on the cyclone wall. Erosion can cause a decrease the performance and increase the maintenance cost of cyclone. CFD simulation was conducted on actual cyclone dimensions used in the coal boiler industry with a diameter of 5120 mm and height of 13970 mm. It was performed using the Reynolds Stress Model (RSM) for turbulence flow in the gas phase and Oka model for the erosion model. The inlet velocities ranged from 7 to 8 m/s and the solid rates ranged from 30 to 40 kg/s with silica sands as solid particles (diameter between 0,075 and 1,5 mm). This study will analyse the erosion rate on the cyclone wall at various gas inlet velocity and solid rate variations. At selected local area, the results shown that the higher gas inlet velocity for the same solid rate will increase the erosion rate (about 25%) and the higher solid rate for the same velocity will also increase erosion rate on the cyclone wall (about 18%).

Development of bamboo-derived activated carbon as catalyst support for glucose hydrogenation

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Abstract

Indonesia possesses high potential to develop an advanced biorefinery system, thanks to its high richness of natural resources. Bamboo for instance, with more than 200 species, in which 5% of its global distribution is found in Indonesian archipelago, is an invaluable resource to develop many useful materials. Here in this study, bamboo has been used to produce activated carbon for catalyst material. Bamboo raw material was obtained from a city park in Surabaya, and converted to activated carbon through carbonization at 773 K, followed by activation using acidic solution treatments. The activated carbon (AC) was used as catalyst support, impregnated by nickel (Ni) as metal active. The Ni/AC was applied as catalyst for hydrogenation of glucose, conducted at 0.5 MPa and 363 – 403 K. With surface area of 125 m_2/g of the carbon supported catalyst applied, glucose could be converted to polyols with overall yield of approximately 3 wt % of the total products.

Effect of operating condition on curcumin extract from Curcuma xanthorrhiza Roxb. using supercritical fluid method

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Abstract

Curcuma xanthorrhiza Roxb. known as temulawak, Javanese ginger or Javanese turmeric, is a plant species, belonging to the ginger family. This plant is originated from Indonesia, more specifically from Java island, and usually used as medicine. It contain high amount of phenolic compound namely curcumin. Supercritical fluid carbondioxide extraction technique was employed to extract curcumin from Curcuma xanthorrhiza Roxb. The objective of this study was to investigate the effects of temperature, pressure and CO2 flow rate to extraction yield and curcumin recovery from C. xanthorrhiza Roxb. extracted using supercritical carbon dioxide and cosolvent ethanol. Box-Behken Design (BBD) experimental design and response surface methodology (RSM) were used to optimize extraction yield and curcumin recovery. The extraction conditions at temperature of 40$_o$C, pressure of 25 MPa and CO_2 flow rate of 5.34 ml/min produced the optimum extraction yield of 10.4% and curcumin recovery of 3.2%. From FTIR analysis, although physical-chemical structure in starting material an residue almost similar, but the quantity of all functional grups in residue decreased from the starting material. From SEM analysis, it was confirmed that the cell was broken due to high pressure effect and finally the material structure was altered.

Performance of biogas production from coffee pulp waste using semi-continuous anaerobic reactor

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Abstract

Abundant coffee pulp waste can be used as a potential biogas feedstock due to its high cellulose and hemicellulose content. However, it contains lignin, caffeine, and tannin that cause severe effects on microbial activity inside the digester, leading to ineffective biogas production. Therefore, alkaline hydrogen peroxide followed by rumen fluid pretreatment had been performed to remove those compounds and improve digestibility of the substrate, respectively. Moreover, the study obtained to find the reaction kinetics in biogas production from coffee pulp waste using a semi-continuous anaerobic reactor with HRT 20, 25, 30 and 35 days and a working volume of 1.5 L operated at 37 ^{o}C. In this study, the chemical pretreatment resulted in 75% of lignin removal, 57.76% of caffeine removal and a decrease in tannin until 0.54%. The highest methane yield obtained in this study was 0.24 L CH_4 g VS^{-1}. The kinetic constants (k) obtained were; k_1 (reaction's kinetic constant): 0.2923 day^{-1}; k_2 (maximum rate of soluble organics production/degradation): 720.1309 mg SCOD L^{-1} day^{-1}; k_3 (saturation constant): 253.2091 mg SCOD L^{-1} day^{-1}; k_4 (maximum rate of TVA consumption): 1,426.0831 mg TVA-COD L^{-1} day^{-1}; and k_5 (saturation constant): 57,794.4025 mg TVA-COD L^{-1} day^{-1}.

Kinetic study of catalytic hydrocracking *ceiba pentandra* oil to liquid fuels over Nickel-Molybdenum/HZSM-5

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Abstract

The conversion of *Ceiba pentandra* oil to catalytic hydrocracking are suitable ways for biofuel. The focus of this study is to use *Ceiba Pentandra* oil catalytic hydrocarbon cracking and determine the alternative to petroleum fuels. The conversion of the *Ceiba pentandra* oil was carried out using a slurry pressure batch reactor, type 4563 PARR with a volume of 200 ml. This conversion process is done by varying the temperature factor (300-400^{o}C), the reaction time over the range of 30-120 minutes and hydrogen pressure over a range of 30 bars using NiMo/HZSM-5. The conditions for the highest conversion of gasoil (C_{15}-C_{18}) as much as 43.78% were temperature of 400 minutes. The same conditions for kerosene (C_9-C_{14}) and long hydrocarbon chains ($>C_{18}$) were present at 4.93% and 2.85% respectively. The kinetic study was determined to determine the order and kinetic parameters of activation energy (Ea) of 84,266 kJ.kgmol^{-1}K^{-1} and the exponential factor from Arrhenius relationship. The order of this reaction has been determined of first order and the kinetic model is defined as $-r_{Tg} = 0.0157C_{Tg}$. *Ceiba pentandra* oil triglycerides hydroconversion pathways were dependent on temperature and reaction time. The triglycerides could be hydrocracked to lower range hydrocarbons (C_9-C_{14}) by increasing the reaction temperatures.

Production of formic acid from oil palm empty fruit bunch via dilute acid hydrolysis by response surface methodology

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Abstract

Formic acid is the simplest carboxylic acid which has myriad applications in food, textiles, agriculture, pharmaceutics, and chemicals. Formic acid can be synthesized in laboratory as major by-product from hydrolysis process of lignocellulosic biomass. Oil palm empty fruit bunch (OPEFB) is an abundant lignocellulosic biomass produced by oil palm industries to which the cellulose content has potential for conversion into formic acid by dilute acid hydrolysis. In this study, we investigated effects of three parameters in acid-catalysed hydrolysis reaction of OPEFB such as reaction time (20, 40, 60 minutes), temperature (140, 160, 180 °C), and H_2SO_4 concentration (0.3; 0.5; 0.7 M) and optimized them to obtain maximum formic acid concentration by using response surface methodology with Box-Behnken Design (BBD). Microwave assisted alkaline pretreatment of OPEFB sample under microwave radiation at 840 Watt for 9 minutes with 2% NaOH concentration was done prior to the hydrolysis process. The pretreatment was effective to reduce lignin content of OPEFB from 28.9% to 7.6%. The highest actual formic acid concentration we obtained from the experiment was 2725 ppm at 180 °C, 60 minutes reaction time, and 0,5 M H_2SO_4. While according to the polynomial model, the optimal condition for obtaining maximum formic acid concentration of 2890.673 ppm was at 180 °C, reaction time of 60 minutes, and 0.3 M H_2SO_4.

Box-behnken design for the optimization using solvent-free microwave gravity extraction of garlic oil from *Allium sativum* L.

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Abstract

Garlic (*Allium sativum* L.) has compounds that could be used as anti-microbial, anti-atheroschlerosis, anti-oxidant, anti-viral, anti-cholesterol, anti-diabetic, anti-hypertension, and anti-cancer. In this paper, oils were extracted from garlic using Solvent-Free Microwave Extraction (SFME) method without solvent which is as an alternative technique to produce oil and it has several advantages in terms of product quality and quantity. This research used technique of gravity for extraction process and produce high yield of garlic oil. The highest results were obtained from this study when at 100 g, 450 W, 10 min, and 0.5 cm. Response surface methodology was designed to evaluate the effects of mass of raw material (g), microwave power (W), extraction time (min) and material size (cm) for optimization of analytical methods. Regression models have designed and predicted experimental values well. Gas chromatography-mass spectrometry (GC-MS) technology was used to analyze the chemical compositions of garlic oil. The results showed that sulphide compounds, like diallyl disulphide, trimethylene trisulfide, ester and alcohol which is found in garlic oil.

Optimization of microwave hydro-distillation of lemongrass leaves (*Cymbopogon nardus*) by response surface methodology

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Abstract

Essential oil of lemongrass (Cymbopogon nardus) or citronella oil is widely used in industry, especially pharmaceuticals and perfumes. The microwave assisted method was successfully applied in extracting fragrant essential oils on a laboratory scale of extraction, namely Microwave Hydrodistilation (MHD). MHD is a combination of hydrodistillation with microwave for extraction. The purpose of this research was to study several effects parameters (microwave power, material size, and extraction time) on the yield of citronella oil obtained by the MHD method and to find optimal conditions using response surface methodology (RSM). The results showed that the smaller size of the material, the lower the yield of oil obtained. The longer extraction time, results in higher yields was. While the greater the power, the higher the yield produced. The highest results obtained for extraction using the MHD method are the microwave power at 600 W, material size of 0.5 cm, and extraction time is 90 min in resulting a yield of 1.817%. Chemical Analysis of citronella oil was the highest component that analyzed by gas chromatography-mass spectrometry (GC-MS) technology.

Effect of intraparticle diffusion-reactions on methane catalytic oxidation performance in reverse flow reactors

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Abstract

This paper delivers mathematical modeling of Reverse Flow Reactor (RFR) which is validated with experimental data for oxidation of methane using Pt/γ-Al2O3 catalyst. To obtain an overview of the flow direction changing on the RFR effect on the reaction rate, the intraparticle diffusion reaction factor needs to be assessed. Flow directing changing in RFR causes the value of tortuosity changes dynamically. Changing in the value of tortuosity will affect the intraparticle diffusion reaction and ultimately cause the reaction rate changes dynamically as well. The model approach that involves intraparticle diffusion reactions is to determine the effectiveness factor. The procedure used is to estimate the effectiveness of the simulated reaction, which allows obstacles due to intraparticle diffusion to be considered at each point of the reactor without using numerical integration of the diffusion equation in the pellet. The conversion results from the RFR simulation on the variated effectiveness factors, is compared to the conversions obtained from the experimental data. The result of the study shows that the RFR operation produces a factor of effectiveness that changes dynamically. In particular, dynamic changing in effectiveness factors can lead to performance improvement over steady conditions. The mathematical model that describes the oxidation dynamics of methane in RFR has been well validated.

Effect of microwave assisted sodium hydroxide pretreatment on hemicellulose content of oil palm empty fruit bunch for furfural production

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Abstract

Oil Palm Empty Fruit Bunch (OPEFB) is one of the main types of solid waste which is continuously produced from palm oil mills. OPEFB contains lignocellulose to which the hemicellulose can be converted into furfural, an important precursor material used for producing high value chemicals, by means of hydrolysis reaction. This process must be preceded by pretreatment in order to disrupt compact lignocellulose structure of OPEFB and to expose hemicellulose for further hydrolysis reaction. In this study, the optimum pretreatment conditions of OPEFB for hemicellulose recovery by microwave assisted alkali method with aqueous sodium hydroxide is evaluated by using response surface methodology (RSM) based on three-level three-factorial Box-Behnken design. OPEFB powder with different size ranging from 30 - 40 mesh was immersed into sodium hydroxide solution at 1 : 10 solid-liquid ratio. Variations of sodium hydroxide concentrations (1; 2; 3%), microwave power (280; 560; 840 Watt), and radiation time (3; 6; 9 minutes) were examined in this study. The quadratic model showed that pretreatment at 593.43-Watt and 1.15 % sodium hydroxide concentration for 5.99 minutes recovered the highest hemicellulose of OPEFB i.e. 23.22%.

Optimization of microwave assisted dilute ammonia pretreatment of oil palm empty fruit bunch using response surface methodology

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Abstract

Indonesia is the largest producer of palm oil in the world. Around one fifth of the palm oil processing weight end up as solid waste, named as oil palm empty fruit bunch (OPEFB). OPEFB is lignocellulosic biomass which contains cellulose, hemicellulose, lignin and minerals. The utilization of cellulose and hemicellulose requires pretreatment to open the lignin bond. This study examines the pretreatment of OPEFB using microwave assisted dilute ammonia. The OPEFB (30 - 40 mesh) was pretreated by ammonia solution with solid-liquid ratio of 1:10 under variated parameters such as ammonia concentration (7.5; 10; 12.5 %), microwave power (280; 560; 840 Watt) and reaction time (3; 6; 9 minutes).The hemicellulose content of all samples was characterized according to SNI 01-1561-1989. The results were optimized using response surface methodology with Box-Behnken model. The model showed that the highest hemicellulose content of 27.3% can be reached at pretreatment conditions of 665-Watt microwave power at 7.5 % ammonia concentration for 3 minutes

Fischer-Tropsch process from synthesis gas over Fe-CO/HZSM-5 catalyst to produce biofuel

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Abstract

Fischer-Tropsch synthesis is the process of converting hydrogen into liquid fuel through several stages, namely: polymerization of CO and H_2 gases into long chain hydrocarbons. From the FT process that requires many of these steps, this research was carried out in order to be able to simplify the Fischer-Tropsch process through limited polymerization to obtain liquid fuels. By combining Co and Fe metal catalysts, it is expected to show better performance than the use of individual metals. Using a Fe-Co/HZSM-5 metal catalyst combination in a fixed bed reactor at a reaction temperature of 225^{o}C. Fe-Co / HZSM-5 catalyst was made by wet impregnation, then Fe-Co/HZSM-5 catalyst was characterized using XRD, BET, and SEM-EDX. From the XRD results, the addition of Fe and Co did not change the crystal structure of the HZSM-5 catalyst. The surface area of the HZSM-5 was 526.03 m^2/g and decreased after the addition of metal (Fe and Co) to the HZSM-5. This change indicates that Fe and Co particles were successfully dispersed on the surface of the HZSM-5 and inserted into the HZSM-5 pore. Hydrocarbon biofuel products are analyzed using GC-MS. The results of GC-MS hydrocarbon products showed the highest compounds for hydrocarbons C_{13} and C_{14} chains were 5.78% and 6.68% at 225 °C.

Triacetin production by selective esterification of glycerol over activated zeolite and lewatite as catalyst

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Abstract

The conversion of glycerol as by product of biodiesel manufacture into value-added product was studied. Esterification of glycerol with acetic acid to triacetin was carried out using activated zeolite and Lewatite as catalyst A selective method for triacetin synthesis was developed to investigate the effect of molar ratio of glycerol to acetic acid (1:6, 1:7 and 1:8). The conversion values at the reactant mole ratio were subsequently 66.91%, 73.36% and 73.16%, while the selectivity obtained was 7.67%, 9.66% and 10.61% respectively. From these results, it can be concluded that the highest conversion was obtained at a reactant mole ratio of 1: 7 and the highest selectivity was obtained at a reactant mole ratio of 1: 8. The result of selectivity with various catalyst type shows that the Lewatit catalyst produces a higher selectivity than the use of activated natural zeolite as a catalyst.

Development of simultan quantification of nonionic surfaktan in chemical flooding using mobile ^{1}H NMR

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Abstract

The use of surfactant in chemical flooding techniques to increase the oil production has been investigated for several decades. However, the injection of surfactant is potential to be lost during the process due to the adsorption of surfactant into the core. It is therefore crucial to analyzed the concentration of surfactant before and after injection to the core. Many methods are developed for determining the content of surfactant using UV-Vis Spectrophotometer by utilizing the chromophore group of the chemical. However, for the analysis of a molecule that lack of this colour function, need to be developed using other techniques, such as mobile $_1$H NMR measurement. In this study, quantification of nonionic surfactant that absent of chromophore group was performed using a combination of mobile 1H NMR with Solid Phase Extraction (SPE). SPE was used to extract the samples that dissolved in water, whereas $_1$H NMR was used to identify the levels of nonionic surfactants that dissolved in deuterized solvents. Internal standard chemical was added to the sample to verify the concentration of samples. As a stationaty phase was SPE C-18 and eluent was methanol, ethyl acetate, and n-hexane. Furthermore, the SPE results were measured using mobile 1H NMR 43 MHz with selected solvents namely deuterized chlorophome ($CDCl_3$) and internal standard Dimethyl Formamide (DMF). Optimization results for determination of surfactant concentration up to 0.5% w/w was using the C-18 stationary phase, mobile phase methanol, ethyl acetate, and *n*-hexane.

Biosurfactant screening of *Halomonas meridiana* BK-AB4 for microbial enhanced oil recovery

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Abstract

Biosurfactant is produced by a certain microorganism to reduce surface tension. Microbial enhanced oil recovery (MEOR) is one of the many applications of biosurfactant. However, the biosurfactant for MEOR needs to be able to withstand the extreme environment of oil reservoirs with high temperature and high salinity. *Halomonas meridiana* BK-AB4 is a halophilic bacteria obtained from the Bledug Kuwu crater in Central Java, Indonesia. The similarity of both environment condition indicates the potential to produce suitable biosurfactant. This study evaluates the potential of *Halomonas meridiana* BK-AB4 in producing biosurfactant compared to several bacteria isolated from the crater. The blood agar test of *Halomonas meridiana* BK-AB4 exhibited greenish discoloration around the colony, indicating the ability of type α-hemolysis. The interfacial tension was measured using the Du Nouy ring method to represent the biosurfactant activity, with the results of 0.014 dyne/cm. The optimum time of the culture starter for production is 6 hours, as determined from the bacterial growth curve.

Peanuts shell as a color adsorbent of methyl violet

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Abstract

The textile waste contains some colors, and also metals which can damage our body and environment. The example of the harmfull substance contain in the waste is methl Violet and lead metal. Methyl violet can cause inhallation and hurt alimentary tract if swallowed. Lead also cause some environmental effects. Lead can accumulated in soils, especially those with a high organic content, where it remains for hundred to thousand years. The solution of the problem is to reduce the contaminant by adsorption. Adsorpstion require adsorbent to perform. Adsorbent can be produced by biomaterial like a peanut shell. Peanut shell contains cellulose which can bend the color and metal so it will separate the contaminant from the water. This research have a purpose to modified and activate the adsorbent to optimal condition, define a characteristic of the adsorbent and define the adsorb capacity. This research is using a peanut shell as the material and furnaced at 450 degree within 2 hours, and screened to 80 mesh and agitated with KOH 50% to remove impuritues from the shells within 30 minutes at 180 rpm. The adsorben then modified by nitric acid 10%, 20%, 30%, 40%, and 50% with 240 rpm agitation to increase the functional groups at 90 degrees celcius within 120 minutes.

The effect of catalyst weight on the photocatalytic performance of ZnO-Ag nanocomposites prepared by flame pyrolysis method

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Abstract

The development of nanoparticle technology is growing continuously for wide range applications, one of which is fabrication of semiconductor materials as photodegradation of organic pollutants using photocatalyst method. ZnO is the most widely used as a catalyst material for photocatalytic application due to a suitable band gap energy and the chemical stability. It was also reported by our previous study that the photocatalytic performance was significantly affected by the Ag content. In this study, ZnO-Ag nanocomposite materials have been successfully fabricated by a flame pyrolysis and the effects of catalyst weight ranging from 2 to 10 mg on the photocatalytic performance were also investigated. Zinc acetate and silver nitrate were used as precursors for producing ZnO-Ag nanocomposites. The catalyst products, ZnO-Ag nanocomposite, were characterized by scanning electron microscopy (SEM) and X-ray diffraction (XRD). While, UV Vis spectrometry was used to measure the concentration of methylene blue (MB) before and after irradiations. Photocatalytic performances of nanocomposites were performed by evaluating the degradation of MB under UV and sunlight irradiations. The photocatalytic tests showed that the best performance was attained when the Ag content was 5 wt% and the weight of catalyst as much as 10 mg after irradiation with sunlight, where the degradation rate of MB was 98 % and the rate constant was 0.09 /min.

Preparation of chitosan-honey-gelatin-based hydrogel for potential active material of wound care dressing application

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Abstract

A dressing is usually applied to the wound care product to help the healing process and prevent infection as well as a complication. Many serious wounds such as massive burns, diabetic wound, and surgical wound are requiring special dressing, which has both antibacterial and proper wound drainage management properties to promote faster healing. Hydrogel composed of chitosan, honey, and gelatin can be a right candidate which provides match properties as required. Preparation of hydrogel has been conducted by the physical blending of the solution of chitosan, honey, and gelatin at 40^{o}C. Then, the mixture was cast to form hydrogel films by each 2-4 mm thickness and followed by drying at 37^{o} C for 24 hours. The resulted hydrogels are characterized to confirm its potential as wound care dressing by measuring gel fraction, swelling index, and antibacterial activity. The gel fraction of the hydrogel composed of 10 and 20 grams of gelatin (each with 0.5 grams of chitosan and 20 grams of honey) was achieved respectively 68,86 % and 65,68%. The gelatin composition of more than 20 grams led to lowering gel fraction significantly. The swelling index of hydrogel with 20 grams gelatin shows almost four times higher. Reducing honey composition to 10 grams of hydrogel has improved both the gel fraction (about 25 %) and swelling index (about 12 %). These two properties have been further enhanced by increasing the chitosan composition up to 7.5 grams. However, the effectiveness of honey composition as an antibacterial in the hydrogel still needs to be also evaluated.

Extraction refined carrageenan using ultrasonic iiridiation from kappahycus alvarezi originated from lontar

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Abstract

Kappaphycus alvarezii or commonly known Euchema cottonii is a source of kappa carrageenan and can be found cultivated in the coastal areas of Indonesia especially in lontar banten province. Kappahycus alvarezi is one type of red seaweed contained kappa carrageenan. Lontar beach in Banten province is one that produced red seaweed In Indonesia. Refined Carrageenan can be used as a stabilizer, thickener, gel, medicine, cosmetics etc. An important factor affected the production of refined carrageenan one of them is the temperature and extraction method. In this study refined carrageenan extracted used the ultrasonic irradiation method from kappahycus alvarezi originated from coastal lontar has never been studied. The objective of this research was determined the effect of temperature using ultrasonic irradiation. The result indicated that higher temperature increased of the sulphate content, gel strength, gelling point and ash content but reduced in moisture and yield. This study the best temparture extraction is 70 ^{0}C

Biodegradable plastic production optimization using response surface methodology

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Abstract

Optimization is a searching technique for variable values considered optimum, e_ective and e_cient, in order to reach the desirable results. An experiment was carried out to see the relationship between response variable and the independent variable. Several comparison tests can be obtained to gain the level that will create optimal response. The aim of this research is to apply the response surface methodology (Central Composite Design) in order to obtain the optimum condition for the process variable in producing biodegradable plastic with lemongrass as antioxidant. Fixed variables in this research are tapioca starch, 69-79$_o$C gelatinization temperature and the total mixture weight that consists of starch, poly(NIPAM)-chitosan, lemongrass oil, acetic acid and water. The independent variables are chitosan, glycerol, and lemongrass oil. The response variables are tensile strength and break of elongation of each biodegradable plastic that is produced. The application of response surface methodology on each biodegradable plastic can be used to obtain the independent variable that makes the optimal response variable. The predicted result of the optimum value for tensile strength and elongation of break lies on the composition treatment of Poly(NIPAM)-chitosan 0.35 grams, glycerol 3.5 grams and 36,55% lemongrass oil with tensile strength result of 3.98 MPa and elongation of break of 36.55%. The model is suitable with 0,5865 and 0,7013 of R_2.

Cellulose extracted from water hyacinth and the application in hydrogel

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Abstract

This paper present the conversion of cellulose based on water hyacinth into hydrogel. The water hyacinth cellulose was prepared using acid-alkaline treatment and bleaching. The cellulose properties was optimized by varying the extraction condition such as solvent concentration and temperature. The analysis method of FTIR and XRD were used for characterizing the functional groups and crystallinity of cellulose. The effective condition of extraction were achieved at solvent concentration 17.5% w/w of NaOH, 8% v/v of H_2O_2 as bleaching agent and temperature of 80_oC. The extracted cellulose was used to produced hydrogels using polyvinyl alcohol and glutaraldehide as crosslinker agent. The research revealed that adding of glutaraldehide with ratio 1:2 at 25_oC give the highest water absorption capacity of 285%.

Utilizing alginate to improve elasticity and moisture balance of polyvinyl alcohol/chitosan hydrogel wound dressing

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Abstract

Uncontrolled hemorrhage is the leading cause of death. The efficient hemostatic dressings are needed to promote coagulation and hold ongoing hemorrhage. Hydrogels are hydrophilic polymers with three-dimensional network structures with high swelling capacity to prevent accumulation of exudates. Hydrogels prepared from polyvinyl alcohol (PVA) grafted with chitosan have attracted considerable attentions due to their biocompatibility, high moisture balance property, and transparency. In this study, alginate was utilized to improve elasticity and thermal stability, also enhance hydrophilicity and increase swelling ability. The hydrogels composed of PVA (7.5 % w/v), chitosan (0.05 % w/v), and alginate (0.2, 0.4, and 0.6 % w/v) were synthesize by gamma irradiation technique at total dose of 15 kGy. The results showed that the increasing of alginate concentration in the total reactant mixture can improve elasticity, swelling capacity and the equilibrium degree of swelling (EDS), and decrease water vapour transmitted rate/moisture vapour transmitted rate (MVTR). The hydrogel wound dressing with 0.6 % of alginate concentration was the best product in this study with 79.49 % gel content, 608.65 % swelling ratio, 628.32 % EDS in 22 hours, elasticity 62.58 KPa, evaporation rate (MVTR) 105g/m^2 h, degraded at temperature of 298.89^{o}C, and the weight loss was reached 88.84 % (w/w).

Transesterification of kapok seed oil (*Ceiba pentranda*) using heterogeneous catalyst bimetallic oxide of zinc and copper supported by γ-alumina

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Abstract

Biodiesel was produced from Kapok seed (Ceiba Pentranda) oil (KSO) using heterogeneous bimetallic oxide of copper and zinc supported by γ-alumina. The Alumina-supported copper oxide- zinc oxide (CuO- ZnO γ /- Al_2O_3) further notated by ACZ was synthesized using precipitation, impregnation and gel methods. It also was characterized using the X-ray diffraction (X-RD), Brunauwer-Emmett Teller (BET), and scanning electron microscopy-EDX (SEM-EDX) methods. Before being transesterified the KSO was pre-treated to reduce gum and free fatty acid content. The activity test of ACZ catalyst was done by introducing it through the transesterification process of KSO with methanol. The transesterification process was conducted in a glass batch type reactor with refluxed methanol. The effect of calcinating temperature (°C), and calcinating time of catalyst (h) on the yield of biodiesel were investigated, respectively. The results showed that the kapok seed oil was worthy and potentially to transesterified into biodiesel using ACZ catalyst.

Sensors and mini photocatalytic reactor as a tool for measure CO2 gas from the degradation of the detergent active compound

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Abstract

This study aims to test the performance and feasibility of new tools and methods for analysis of detergent based on the photocatalytic degradation of LAS and ABS, which is a detergent active compound. Testing is done by measuring the CO_2 gas formed from the degradation at every one-hour for five hours of reaction. The results of the determination of analytical parameters are as follows, sensitivity: 0.394 to 0.460, the limit of detection: 0.16 mg/L, accuracy: 0.94% to 12.88% and punctilio: 0.12% to 0.14%, the range of linearity: 0.4 mg/L to 2 mg/L. Results of calibration using standard solutions obtained regression equation y = 1.033 x - 77.713 with R2 = 0.988, indicating that the instrument has been calibrated and fit for use for the analysis of LAS and ABS with concentrations above or equal to 25 mg/L. The test results showed that the developed method is practical, effective and efficient.

Synthesis and characterization of PLA-CNC matrix for antidiabetic drug delivery applications

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Abstract

Recently, drug nanoparticles formulation using Poly Lactic Acid-Cellulose nanocrystal (PLA-CNC) have been introduced. PLA-CNC were prepared by emulsion method for antidiabetic drug delivery applications. PLA is one of polymer which potentially used as raw material of drug delivery because it has the ability to bind and carry drugs into cell target, but the hydrophilic character of PLA cause the degradation of PLA in the body run slowly, so it is necessary combining PLA with CNC to improve its property. In this study, special attention has been given to the modification of PLA-CNC as a drug delivery matrix to obtain the optimum drug release of antidiabetic drugs. The combination of chemical PLA-CNC matrixs were characterized using FTIR and SEM, its drug loading capacity, encapsulation efficiency and in vitro drug release behavior was determined by using UV spectrophotometer.