

12th Joint Conference on Chemistry



2017



Program Book



Crystall Ballroom, Aston Hotel and
Convention Centre, Semarang, Indonesia



19-20 September 2017
Semarang, Indonesia

Organized by:





**The 12th Joint Conference
on Chemistry- 2017**
19-20 September 2017
Semarang, Indonesia

WELCOME

to the 12th Joint Conference on Chemistry 2017 (JCC-12)

On behalf of the Conference Committee, we welcome you to Semarang, Indonesia!

JCC-12 is the 12th in a series of international conference organized by Chemistry Departments in Central Java, Indonesia. The Universities are Universitas Negeri Semarang (UNNES), Universitas Diponegoro (UNDIP), Universitas Sebelas Maret Surakarta (UNS), Universitas Jendral Soedirman (UNSOED). Universitas Kristen Satya Wacana (UKSW). The conference is also supported by Himpunan Kimiawan Indonesia (HKI).

During this two days (19-20 September 2017) you'll join your colleagues for quality scientific and networking opportunities. We hope you'll enjoy the program our Committee has assembled, including lecturer sessions, keynote session and parallel presentation and much more in this beautiful location.

The Conference adopts a timely theme **Contributions of chemical sciences, engineering, education, and technology in solving global challenges**. Chemistry is one of the keys to create a sustainable society, and for that purpose we need to reinforce the chemistry science, technology and education and to extend our finding to innovation.

I would like to thanks to all the keynote and invited speakers both from domestic and abroad institutions, for all of your kind contribution to our annual event. We hope this event bring together researchers and experts in the chemistry and related fields, and to provide all the participants with opportunities to have more profound understanding and integration of fundamental concept and latest developments of chemistry and chemistry education.

Again, We hope you'll enjoy the program our Committee has assembled. Our Conference Committee and staff have worked hard to ensure you have the best possible conference experience. If you need anything during the conference, please stop by the Registration Desk.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Cepi Kurniawan'.

Cepi Kurniawan, PhD
Conference chair.



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**Welcoming speech by Dean of Faculty of Mathematics and
Natural Sciences, Universitas Negeri Semarang
at the Opening Ceremony of the 12th Joint Conference on
Chemistry (JCC-12, 2017)
19 September 2017**

Good morning!

It's my pleasure to welcome you all to the 12th Joint Conference on Chemistry 2017 (JCC-12)

This is the twelvethseries of annual academic conferences exploring how chemistry and related fields could be effectively utilized in developing and sustaining new technology, methods, and teaching materials. For many years, the Chemistry departments of five universities located in central Java has been co-organizing this annual conferences. I am delighted to see that five institutions have again well-organized the JCC-12.

The theme of this annual conference entitledContributions of chemical sciences, engineering, education, and technology in solving global challenges. Chemistry has penetrated into all areas of live. To effectively benefit from chemical science both basic and applications, it is essential that professionals set themselves ready for transforming their practices and keep identifying effective ways for transformations in their contexts.

If you take a look at the Conference Programme, you will agree that this inaugural Conference is going to be busy and productive. I would like to take this opportunity to thank the Conference Organizing Committee for their diligent work. I would also like to thank participants, especially those of you coming from abroad, for joining us and sharing your valuable experience and ideas. It is essential to bring together experts in the field of chemistry and chemical education so that we can realize our recent position and contribution.

As it is requested by the committee, I declare that the 12th Joint Conference on Chemistry, organized by Chemistry department of Faculty of Mathemathics and Natural Sciences officially opened

In closing, I hope that all of you will enjoy the Conference, and I wish our visitors from abroad will have a very pleasant stay in our city.

Thank you.

Prof. Dr. Zaenuri, S.E, M.Si., Akt.

Dean of Faculty of Mathematics and Natural Sciences

Universitas Negeri Semarang



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GENERAL INFORMATION

Here are a few hints, tips and reminders for your conference experience:

Wear Your Name Badge

You will receive your JCC-12 Conference name badge at registration. Please remember to wear your badge to all conference events. For safety reasons, we recommend that you remove your badge and store it in a safe place when you leave the hotel for any non-conference activities.



PRESENTER / PARTICIPANT



COMMITTEE

Silence Your Cell Phone/Laptop

Please be sure your cell phone and audio on your computer are on silent. Thank you for this courtesy to speakers and registrants to ensure a professional educational environment during sessions.

Breakout Parallel session

During the conference, we will have 9 parallel sessions (Room A to Room I) and 1 Poster session (Ballroom). See the next pages.

1. Each room will be lead by a moderator as a chair of presentations
2. All of the presenter (Both invited speakers and oral presenters) should deliver a talk within:
 - a. 15 minutes for invited speaker
 - b. 10 minutes for oral presenterFollowed by question and answer session for 5 minutes.
3. The moderator will manage the presentation time
4. **If your registration code is not on the list or in a wrong session, please immediately come to the registration desk**

Guidelines for poster presenters

1. Posters should be mounted by 13:00 on 19 September to be presented and must be removed after the last session (16.00).
2. Presenters are expected to stand next to their posters for informal discussions during the designated poster session time.
3. The organizers are not responsible for any posters that have not been removed by the end of the sessions



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DAILY GRID

18 September 2017

18.30 – 21.00	Welcoming Dinner	Aston Hotel ballroom
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19 September 2017

07.00-08.15	Registration
08.15-08.35	Opening Ceremony
	Indonesia National Anthem
	Welcoming Dance
08.35-08.40	Chairman speech Cepi Kurniawan, PhD
08.40-08.50	Welcoming from the head of department
08.50-09.00	Welcoming speech and opening the conference by the Dean Prof. Dr. Zaenuri M., S.E, M.Si, Akt.
09.00-09.20	Coffee Break
09.20-10.00	Prof. Guoping Chen Hybrid Scaffolds of Biodegradable Polymers and Biomimetic Matrices for Tissue Engineering Applications
	Chair: Sri Kadarwati, PhD
10.00-11.00	Prof. David Harding Designing Molecular Switches: A Molecular Magnetism Approach
	Prof. Hadariah Bahron Imines and Metals: Marriage Made in Heavens
	Chair: M. Alauhdin, PhD
11.00-12.00	Prof. Kasmadi Imam Kasmadi The Cultivation of Religious Characters in Chemical Science Learning
	Prof. Subramaniam Ramanathan
	Chair: Sri Kadarwati, PhD
12.00-13.00	Lunch Break
13.00-14.00	Prof. Ni Nyoman Tri Puspaningsih Strengthening The Academic Network on Bioresource Technology Research towards Green Industry
	Prof. Hajime Hirao Computationally Exploring Complex Molecular Systems
	Chair: M. Alauhdin, PhD



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BREAKOUT SESSION 19 September 2017

Time	ROOM A	ROOM B	ROOM C	ROOM D	ROOM E	ROOM F	ROOM G	ROOM H	ROOM I	Ballroom		
										Poster		
14.00-14.15	JCC2017 262	JCC2017 SUP	JCC2017 135	JCC2017 RAW	JCC2017 AMF	JCC2017 SRA	JCC2017 KDN	JCC2017 DDH	JCC2017 212	JCC2017 207	JCC2017 016	JCC2017 063
14.15-14.30	JCC2017 278	JCC2017 155	JCC2017 131	JCC2017 166	JCC2017 014	JCC2017 134	JCC2017 306	JCC2017 MMM	JCC2017 254	JCC2017 007	JCC2017 305	JCC2017 308
14.30-14.45	JCC2017 278	JCC2017 270	JCC2017 179	JCC2017 167	JCC2017 123	JCC2018 SSS	JCC2017 224	jcc2017 144	JCC2017 079	JCC2017 199	JCC2017 311	JCC2017 172
14.45-15.00	JCC2017 125	JCC2017 298	JCC2017 185	JCC2017 258	JCC2017 088	JCC2017 074	JCC2017 006	JCC2017 008	JCC2017 103	JCC2017 189	JCC2017 255	jcc20170 37
COFFEE BREAK (Parallel session is still continued)												
15.00-15.15	JCC2017 271	JCC2017 237	JCC2017 301	JCC2017 083	JCC2017 108	JCC2017 293	JCC2017 061	JCC2017 318	JCC2017 169	JCC2017 300	JCC2017 064	JCC2017 188
15.15-15.30	JCC2017 065	JCC2017 149	JCC2017 165	JCC2017 198	JCC2017 310	JCC2017 275	JCC2017 267	JCC2017 157	JCC2017 101	JCC2017 111	JCC2017 274	jcc2017 139
15.30-15.45	JCC2017 302	JCC2017 086	JCC2017 203	JCC2017 307	JCC2017 129	JCC2017 228	JCC2017 314	JCC2017 276	JCC2017 209	JCC2017 010	JCC2017 036	JCC2017 ATP



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Time	ROOM A	ROOM B	ROOM C	ROOM D	ROOM E	ROOM F	ROOM G	ROOM H	ROOM I	Ballroom		
										Poster		
15.45-16.00	JCC2017 069	JCC2017 062	JCC2017 025	JCC2017 126	JCC2017 216	JCC2017 277	JCC2017 098	JCC2017 244	JCC2017 312	JCC2017 022	JCC2017 222	JCC2017 028
16.00-16.15	JCC2017 122	JCC2017 247	JCC2017 118	JCC2017 226	JCC2017 313	JCC2017 313	JCC2017 283	JCC2017 178	JCC2017 157	JCC2017 073	JCC2017 206	JCC2017 317
16.15-16.30	JCC2017 193	JCC2017 197	JCC2017 248	JCC017 WST	JCC2017 144	JCC2017 310	JCC2017 263	JCC2017 240	JCC2017 AHW	JCC2017 304	JCC2017 BBB	JCC2017 315
										JCC2017 309	JCC2017 BCH	JCC2017 SHR
										JCC2017 PLS		
16.45 – 17.00	CLOSING											



REG. CODE	Title	Author(s)
JCC2017006	Glycerol Steam Reforming for Hydrogen Production Over Ni/Co/NiCo/ZSM-5 Catalyst	Widayat Widayat1,2, AriantiNuur Annisa1, Hantoro Satriadi1, Eunice Elizabeth1, Richard Hartono1, Syaiful3
JCC2017007	Formulation and Antifungal Activity of Ointment Type of M/A From Ethanol Extract of White Plumeria Leaves (Plumeria alba L.) on Candida albicans	D R Ningsih, Zufahair, D Kartika, M. Lianasari
JCC2017008	Preparation and Physico-Chemical Properties of Gracilaria/PVA/GA/CNT-Based Hydrogel for Slow/Controlled Release Material	Hendrawan Hendrawan1, Fitri Khoerunnisa2, FerinaIhsani Ekawati3, Yaya Sonjaya4
JCC2017010	Dynamic adsorption of mixtures of Rhodamine B, Pb(II), Cu(II) and Zn(II) ions on composites chitosan-silica-polyethylene glycol membrane	F. Widhi Mahatmantil*, W. D. P. Rengga2, E. Kusumastuti1, Nuryono3
JCC2017014	ZrO ₂ /bamboo leaves ash (BLA) Catalyst in Biodiesel Conversion of Rice Bran Oil	Is Fatimah1, Ana Taushiyah1, FitriBadriatun Najah1, Ulil Azmi1
JCC2017016	Probing the Interaction Between Cyclic ADTC1 (Ac-CADTPPVC-NH ₂) Peptide with EC1-EC2 domain of E-cadherin using the Molecular Docking Method	Parsaoran Siahaan1, Sri Wuning1, Atiatul Manna1, VivitriDewi Prasasty2, Dwi Hudiyan1
JCC2017022	Increasing character value and conservation behavior through integrated ethnoscience chemistry learning (a case study in the department of science universitas negeri semarang)	Sudarmin1, Woro Sumarni2, Agung Tri Prasetya3
JCC2017025	Synthesis and Characterization of Diranitidinecopper(II) Sulfate Dihydrate	H Syaima1, S B Rahardjo2, and I M Zein2
JCC2017028	Synthesis and Characterization of SrO/Zeolite Nanoparticle as CatalystalTransesterification Reaction of Used Cooking Oil	Widiarti Nuni1, UtamiNofita Sari1, F. Widhi Mahatmantil Harjito1, Cepi Kurniawan1, Didik Prasetyoko2, Suprpto2
JCC2017036	Development of Assessment Instruments to Measure Critical Thinking Skills	Woro Sumarni1, Kasmadi Imam Supardi2, Nuni Widiarti3
JCC2017037	Application of Sodium Ligno Sulphonate as Surfactant In Enhanced Oil Recovery and Its Feasibility Test for TPN 008 Oil	N I Prakoso1, Rochmadi2 and S Purwono2
JCC2017061	Treatment of Waste Lubricating Oil by Chemical and Adsorption Process Using Butanol and Kaolin	Riyanto1, Bayu Ramadhan1 and Deni Wiyanti1
JCC2017062	The Effect of Temperature and Time in The Manufacture of Gelatin Powder from Waste Fish Scales as A Source of Food Protein Towards National Food Security	Muhammad Afandi1, Faqihudin Mubarak1, Muhammad Farid Thahir1, Pratika Febrianti1, Tissasera Iseki1, Suherman S.T,M.T1
JCC2017063	Two Bisabolanes from Curcuma xanthorrhiza Rhizomes and Their Antibacterial Activity	Hartiwi Diastuti1, Yana Maolana Syah2, LiaDewi Juliawaty2, Marlia Singgih3



REG. CODE	Title	Author(s)
JCC2017064	A Comparison Study of Sodium Lignosulfonate, Sodium Dodecyl Benzene Sulfonate, and Sodium p-Toluene Sulfonate Surfactant for Enhanced Oil Recovery	Argo Khoirul Anas ¹ , NurcahyoIman Prakoso ¹ , Dilla Sasvita ¹
JCC2017065	Optimization Recovery Yttrium Oxide (Y ₂ O ₃) In Precipitation, Extraction and Stripping Process	NizarKamil Pewira ¹ , Kris Tri Basuki ¹ , Dwi Biyanto ² , Nuradam Effendy ¹
JCC2017069	The Effect of Mole Comparison of Acetone as Co-Solvent to Methanol in Transesterification Reaction of Waste Cooking Oil	TatangShabur Julianto ¹ , Rizqy Nurlestari ¹
JCC2017073	Antimicrobial Activity of Saponin Compounds from Oil-Free Mahogany Seeds (Swieteniamacrophylla, King)	Sri Mursiti ¹ , Supartono ¹
JCC2017074	Generic Science Skills Enhancement of Students Through Implementation of IDEAL Problem Solving Model On Genetic Information Course	Aisyah Zirconia ¹ , Florentina Maria Titin Supriyanti ¹ ., Asep Supriatna ¹
JCC2017079	Sunlight-Assisted Synthesis of Colloidal Silver Nanoparticles Using Chitosan as Reducing agent	Endang Susilowati ¹ , Maryani ² , Ashadi ³
JCC2017083	Modification of PolyeugenolDirivate Contain Ethylene Glycol Dimethacrylate (EGDMA) as a Carrier for Phenol Trasport	AgungAbadi Kiswandono ¹ , Dwi Siswanta ² , NurulHidayat Aprilita ² , Sri Juari Santosa ²
JCC2017086	Determination of Urease Biochemical Properties of Asparagus Bean (Vignaunguiculatasspsesquipedalis L.)	Zusfahair ¹ , D R Ningsih ¹ , A Fatoni ¹ , D S Pertiwi ¹
JCC2017088	Concentration Effect of Silver Doped Titania Synthesized by Sonochemical Method and Ability Test of Anti Bacterial S. Aureus	Heri Sutanto ¹ , Eko Hidayanto ¹ , Mukholit ¹ , Jhon Wesley Manik ¹ , Ahmad Nimatullah Al-Baarri ²
JCC2017092	Membran-Based Synthesis of Chitosan Crosslinked Succinic Acid Grafted with Heparin/Pva-Peg (Polyvinyl Alcohol-Polyethylene Glycol) and its Characterization	RetnoAriadi Lusiana ¹ , Yayuk Astuti ¹ , ViviDia A Sangkota ¹
JCC2017098	Characterization of Bio-Oil from Fast Pyrolysis of Palm Frond and Empty Fruit Bunch	Maharani Dewi Solikhah ¹ , Fatimah Tresna Pratiwi ¹ , Yayan Heryana ¹ , AndriasRahman Wimada ¹ , Feri Karuana ¹ , AlfonsusAgus Raksodewanto ¹ , Agus Kismanto ¹
JCC2017101	Encapsulation of Vitamin C and Beta Carotene in Sesame (SesamumIndicum L.) Liposomes	Dwi Hudiyaniti ¹ , Heralda Fawrin ¹ , and Parsaoran Siahaan ¹
JCC2017103	Renewable Copolymer of Eugenol-Stearyl Acrylate as an Oil Absorbent	Alifia H. Rachma ¹ , Lia F.1, Marita M. Putri ¹ , and Desi S. Handayani ¹
JCC2017108	Study of Catalyst Variation Effect in Glycerol Conversion to Hydrogen by Steam Reforming Process	Widayat ^{1,2} , Richard Hartono ¹ , Eunice Elizabeth ¹ , AriantiNuur Annisa ¹



REG. CODE	Title	Author(s)
JCC2017111	Kinetics Study of Cu-DBDTC (Di-N-buthylditiocarbamate) formation	Sri Haryani, Agung Tri P., Sri Wardani, C. Kurniawan
JCC2017118	Extraction of Gelatin from Catfish Bone Using Naoh and its Utilization as a Template on Mesoporous Silica Alumina	Rahmad Nuryanto ^{1,2} , Wega Trisunaryanti ¹ , IipIzul Falah ¹ , Triyono ¹
JCC2017122	2,4,6-Trimercapto-1,3,5-Triazine - Modified Gold Nanoparticles in Colloidal System and Its Potency as Formalin Detector	Yoki Yulizar ¹ , HaritsAtika Ariyanta ^{1,2} , Lutfita Rakhmania ¹
JCC2017123	Synthesis of N-doped ZnO Thin Film by Sol-gel Method and Its Photodegradation Activity to Coliform Bacteria Under The Visible Light Irradiation	Muhammad Irwanto, AgusRomadhon, YunitaIndriyani, Gemma TristadaksaAcintyasakti, Kuwati
JCC2017125	Analysis Study of Stevioside and Rebaudioside A from Stevia rebaudianaBertoni By Normal Phase SPE and RP-HPLC	Yohanes Martono ¹ , Abdul Rohman ² , Sugeng Riyanto ² , and Sudibyo Martono ²
JCC2017126	A Green route fast synthesis and characterization of 2,4,6-triacetyl-1,3,5-trihydroxybenzene: an analogue of acylphloroglucinol natural product	T Kusumaningsih ¹ , M Firdaus ¹ , and W E Prasetyo ¹
JCC2017219	Sorption Isotherm Modelling Of Fermented Cassava Flour by Red Yeast Rice	M N Cahyanti ¹ , M N Alfiah ² , S Hartini ³
JCC2017131	Synthesis of a New Materials of Silica-Methyl Quaternary Ammonium-Magnetite Nanoparticles and Its Applications as Adsorbent of Cu(II) in Aqueous Solution	Ngatijo ¹ , Nuryono ² , Faizar Faried ¹ , Nofrizal Jhon ¹ and Dwi Haryadi ¹
JCC2017134	Development of Intertextual Learning Strategy with Guided Inquiry on Solubility Concept to Improve the Student's Scientific Processing Skills	K U Wardani ¹ , Sri Mulyani ¹ , Wiji ²
JCC2017135	Synthesis and Characterization of Tetrakis(2-amino-3-methylpyridine) copper(II) Sulfate Tetrahydrate	S B Rahardjo ¹ , T E Saraswati ¹ , A Masykur ¹ , N N F Finantrena ¹ , H Syaima ²
JCC2017139	UTILIZATION OF HYDROTALCITE MODIFIED WITH 3,4,5-TRIHYDROXY BENZOIC ACID FOR THE TREATMENT OF SILVER-CONTAINING WASTEWATER	I Yanti ^{1*} , W F Winata ² , M Anugrahwati ¹
JCC2017144	TURPETIN OIL ISOMERIZATION WITH TCA/NATURAL ZEOLITE CATALYST USING MICROWAVE IRRADIATION	N. Wijayati ¹ , Supartono ¹ and E. Kusumastuti ¹
JCC2017149	Preliminary Study of Hyptispectinata (L.) Poit Extract Biotransformation by Aspergillusniger	Desi Sri Rejeki ¹ , Agustina L. N. Aminin ² , Meiny Suzery ³
JCC2017155	Toxicity Tests, Antioxidant Activity, and Antimicrobial Activity of Chitosan	Mardiyah Kurniasih ¹ , Purwati ¹ , RatnaStia Dewi ²
JCC2017157	Encapsulation of Iron and Vitamin C in Coconut (CocosNucifera L.) Liposomes: Efficiency and Leakage	Dwi Hudiyaniti ¹ , VinaAngerina Panjaitan ¹ , and Parsaoran Siahaan ¹



REG. CODE	Title	Author(s)
JCC2017165	Effectiveness Study of Drinking Water Treatment In Indonesian Regulation of Health Minister Using Adsorbent Clays Appeal Andisol In Lariat Heavy Metal Cadmium (Cd) and Bacterial Pathogens	Dr. Pranoto, M.Sc ¹ , Inayati, S.T., M.T, Ph.2 , Fathoni Firmansyah ³
JCC2017166	Radical Scavenging Activity from Ethanolic Extract of Malvaceae Family's Flowers	AnifNur Artanti ¹ , Niki Rahmadanny ¹ , Fea Prihapsara ¹
JCC2017167	Golden Wattle (<i>Acacia pycnantha</i>) Flower: Is it Only Floral Emblem of Australia?	Rudi Hendra ^{1,2} , Paul Keller ²
JCC2017169	Electrochemical Disinfection of Coliform and <i>Escherichia Coli</i> for Drinking Water Treatment By Electrolysis Method Using Carbon Electrode	Riyanto ¹ , Wanda Rusma Agustiningih ¹
JCC2017172	Prenylation of Pinostrobin and Antibacterial Activity Against Clinical Bacteria	Soerya Dewi Marliyana ¹ , Didin Mujahidin ² and Yana M Syah ²
JCC2017178	Simple Approach in Understanding Interzeolite Transformations Using Ring Building Units	Dede Suhendar ^{1,2} , Buchari ² , Rino R. Mukti ² , Ismunandar ²
JCC2017179	The Effect of Mangoosteen Extract (<i>Gracinia Mangostana</i> L.) on Synthesis of Ag ₃ PO ₄ Photocatalyst	Mohammad Afif ¹ , Alfa Marcorius ¹ , Khusnul Afifah ¹ , Siti Nurfiyah ¹ , Khanifudin Khanifudin ² , Febiyanto Febiyanto ² , Uyi Sulaeman ^{1*}
JCC2017185	Transformation of Indonesian Natural Zeolite into Analcime Phase under Hydrothermal Condition	Witri Wahyu Lestari ¹ , Dien Nur Hasanah ¹ , Riandy Putra ^{1,2} , Rino Rakhmata Mukti ³ , and Khoirina Dwi Nugrahaningtyas ¹
JCC2017188	Synthesis and Characterization of SrO/Zeolite Nanoparticle as Catalyst for Transesterification Reaction of Used Cooking Oil	Widiarti Nuni ¹ , Utami Nofita Sari ¹ , F. Widhi Mahatmanti ¹ Harjito ¹ , Cepi Kurniawan ¹ , Didik Prasetyoko ² , Suprpto ²
JCC2017189	Ar-Turmerone a Sesquiterpenoid from <i>Curcuma Soloensis</i> . Val (Temu Glenyeh) Rhizome Extract	Gesti Munasah ¹ , M. Widyo Wartono ¹ , Fajar Rakhman Wibowo ¹ , Soerya Dewi Marliyana ¹
JCC2017193	Identification and Control of Unknown Impurity in Trimetazidine Dihydrochloride Tablet Formulation	Jefri ¹ , Didik Harmoko ¹ , Agustina Dian Puspitasari ² , Joseph Sunder Raj Talpaneni ¹ , Raymond R Tjandrawinata ^{1,2,3}
JCC2017197	Modifications of Deoxynojirimycin (DNJ) Compound as α -Glucosidase Inhibitor for the Dengue Fever Treatment	Usman Sumo Friend Tambunan, Hanum Ariza Deski, Moch. Arifin Fardiansyah Nasution
JCC2017198	5-Substituted Isatin Derivatives: Synthesis and Anti-tubercular Activity Against <i>Mycobacterium tuberculosis</i> H37Rv	M. Riza Ghulam Fahmi ¹ , Laili Khumaidah ¹ , Trividiati Khusnul Ilmiah ¹ , Arif Fadlan ¹ , Mardi Santoso ¹
JCC2017199	Formulation of Antibacterial Liquid Soap from Nyamplung Seed Oil (<i>Calophyllum inophyllum</i> L.) with Addition of <i>Curcuma heyneana</i> and its Activity Test on <i>Staphylococcus aureus</i>	Senny Widyaningsih ¹ , Moch. Chasani ¹ , Hartiwi Diastuti ¹ , Novayanti ¹



REG. CODE	Title	Author(s)
JCC2017203	Chitosan as Natural Coagulant to Minimize Hg (II) Levels in Bone River Waters of Gorontalo Province	Astin Lukum ¹ , Asda Rauf ² , Jefrin Akume ¹ , ArfianiRizki Paramata ³
JCC2017206	Adsorption Kinetics of Sodium Lauryl Sulfate (SLS) and Hexadecyltrimetilammonium Bromide (HDTMABr) Surfactants on Activated Carbon	Arnelli ¹ , Aditama WP ¹ , Zul Fikriani ¹ , Yayuk Astuti ¹
JCC2017207	The Effect of Cellulose Acetate Concentration from Coconut Nira on Ultrafiltration Membrane Characteristics	Eva Vaulina ¹ , Senny Widyaningsih ¹ , Dwi Kartika ¹ , Mia Putri Romdoni ¹
JCC2017212	Supramolecular Assembly of Group 11 Phosphorescent Metal Complexes for Chemosensors of Alcohol Derivatives	Hendrik O. Lintang ^{1,2,3} , NurFatiha Ghazalli ^{4,5} , Leny Yuliaty ^{1,2,3}
JCC2017216	Ab Initio Computational Study of –N-C and –O-C Bonding Formation : Functional Group Modification Reaction Based Chitosan	Parsaoran Siahaan ¹ SitiNurMilatus Salimah ¹ , Marta J. Sipangkar ¹ , Dwi Hudiyaniti ¹ , M. Cholid Djunaidi ¹ , Marlyn Dian Laksitorini ²
JCC2017222	Development of Performance Assesment Instrument Based on Contextual Learning to Measure Students Laboratory Skill	EndangSusilaningsih, KhusnulKhotimah, Sri Nurhayati
JCC2017224	FTIR and FT-Raman analysis of Bentonite Modified with 3-aminopropyltrimethoxysilane	E. Pramono ^{1,3} , C. L. Radiman ¹ , D. Wahyuningrum ² , W. Pratiwi ¹
JCC2017226	Chemical and Physical Composition and Mosquito Repellent Activity of Fractionation Active Component from Java Citronella Oil (Cymbopogonwinterianus)	Willy Tirza Eden ¹ , Dante Alighiri ¹ , Edy Cahyono ² , Kasmadi Imam Supardi ³ , Nanik Wijayati ²
JCC2017228	Removal of Cadmium from Wastewater by Adsorption with The Modified Iron-Mesoporous Silica SBA-15	Desita ¹ , Mmaria Ulfa ¹ , TeguhEndah Saraswati ² And Bakti Mulyani ¹
JCC2017237	Molecular Docking Simulation of Neuraminidase Influenza a Subtype H1N1 with Potential Inhibitor of Disulfide Cyclic Peptide (DNY, NNY, LRL)	Usman Sumo Friend Tambunan ¹ , Riski Imaniastuti ¹ , MochammadArfinFardiansyah Nasution ¹ , Djati Kerami ²
JCC2017240	Analysis of Hydrogen Gas Production from Seawater Electrolysis Using Variation of Voltage	Yoyon Wahyono ¹ , Heri Sutanto ¹ , Eko Hidayanto ¹ , Ladaina Noura ¹ , Eko Siswoyo ²
JCC2017244	Aluminium - Cobalt-Pillared for Dye Filtration Membrane	Adi Darmawan ¹ , Widiarsih ¹
JCC2017247	Fractionation of Glucomannan, New Hope for Corneal Lamellar Laceration Therapy, “A Preliminary Study”	A. Kartiwa ¹ , M. Prayoga ¹ , S. Heryati ¹ , N. Atik ² , D. Sariawati ² , S. Bardi ³ , M. Fadhillah ⁴ , T. Subroto ⁴
JCC2017248	Characterization of ZnO Nanoparticles from Waste Galvanized by Using Acetic Acid Extraction Followed by Precipitation	RismaDewi Dahlianti ¹ , AprianRudina Sukma ² , Iftitah ³ , Daisman P. Bayuaji ¹ , Dody Prayitno ¹ , Ersan Y. Muhlis ¹



REG. CODE	Title	Author(s)
JCC2017254	Assessment of Drug Binding Potential of Pockets in the NS2B/NS3 Dengue Virus Protein	Fitri Amelia ¹ , Iryani ¹ , Prima Yulia Sari ¹ , ArliAditya Parikesit ² , Ridla Bakri ² , Erwin Prasetya Toepak ² , Usman Sumo Friend T
JCC2017255	Potentials of n-Heksan, Aseton and Ethanol Fraction Extract in Palmyra Fruit (<i>Borassusflabellifer</i> L.) as Antioxidant	Sukmawati
JCC2017258	Synthesis of Eugenol–Lauryl Methacrylate Copolymers via Cationic Polymerization	Aisyah Fajrin ¹ , Soerya Dewi Marlina ¹ , Desi Suci Handayani ¹
JCC2017262	Modification of montmorillonite with tetraethyl ortosilicate (TEOS) and cetyltrimethylammonium bromide (CTAB)	Dian M. Widjonarko, Oktaviana D. Mayasari, Khoirina D. Nugrahaningtyas, Sayekti
JCC2017263	Chemical Characteristics And Fatty Acid Profile Of Butterfly Tree Seed Oil (<i>Bauhinia Purpurea</i> L)	H Soetjipto* , C A Riyanto* T Victoria*
JCC2017267	Effect of Temperature to Adsorption Capacity and Coefficient Distribution on Rare Earth Elements Adsorption (Y, Gd, Dy) Using SIR	Nofriady Aziz ¹ , Aswati Mindaryani ² , Supranto ² , Agus Taftazani ³ , Dwi Biyanto ³
JCC2017270	The Wastewater Treatment Processes and Mechanism of Organic Matter Removal by Modified Multi-Soil-Layering System	Roy Andreas ¹ , Irmanto ¹
JCC2017271	Quantitative Analysis of Curcuminoid Collected from Different Location in Indonesia by TLC-Densitometry and Its Antioxidant Capacity	Dinar Sari C. Wahyuni ¹ , AnifNur Artanti ¹ , Yudi Rinanto ²
JCC2017274	Photocatalyst of Perovskite CaTiO ₃ Nanopowder Synthesized from CaO derived from Snail Shell and Comparison with CaO and CaCO ₃	Is Fatimah ¹ , Yeka Rahmadianti ¹ , RizkyAyu Pudiasari ¹
JCC2017275	Surface and Groundwater Interactions: Cikapundung Bandung, Kanal BanjirTimur Semarang and CisadaneTangerang	Dasapta Erwin Irawan ¹ , Endah Sulistyawati ² , AleciaArtita Midori ³ , Budi Faisal ³
JCC2017276	Effect of Ratio of Sugar Palm Fruit (<i>Arengapinnata</i>) and Carrageenan and Citric Acid on Moisture Content, Biodegradability, and Functional Groups of Biodegradable Film	Safira Aulia Rinanda ¹ , Muhammad Nastabiq ¹ ,Sonya Hakim Raharjo ¹ , Shifa Karima Hayati ¹ , Muhammad Ainul Yaqin ¹ , and Ratnawati ¹
JCC2017277	The role of pectin in Pb binding by carrot peel biosorbents : Isoterm adsorption Study	Budi Hastuti, and DwiSiswanta
JCC2017278	Curcuminoid content of Curcuma longa L. and Curcuma xanthorrhiza rhizome based on drying method with NMR and HPLC-UVD	Saptono Hadi 1* , Dinar Sari C. Wahyuni 1 , Anif Nur Artanti 1 , Yudi Rinanto 2
JCC2017283	Effect of Preparation Methods on the Activity of Titanium Dioxide-Carbon Nitride Composites for Photocatalytic Degradation of Salicylic Acid	Leny Yuliaty ¹⁻³ , AzlanMohd Salleh ⁴ , MohdHayrieMohd Hatta ⁴ , Hendrik O. Lintang ¹⁻³
JCC2017293	Separation of Gadolinium (Gd) Using SinergisSolven Mixed Topo -D2ehpa With Extraction Method	Nuradam Effendy ¹ , Kris Tri Basuki ¹ , Dwi Biyanto ² , Nizar Kamil Pewira ¹



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JCC2017298	Carp Operculum Bone (Cyprinus Carpio Sp.) Scaffold is A Potential Xenograft Implant Material: A Histological Study	A Kartiwa ¹ , B Abbas ² , P Pandansari ² , N Atik ³ , RAA Syamsunarno ⁴ , SF Boesoirie ¹ , MR Dahlan ¹ , K Boesoirie ¹ , A Prahasta ¹ , M Nandini ⁵ , M Fadhilah ⁶ , A Switania ¹ , T Subroto ⁶ and R Panigoro ⁴
JCC2017300	Photodegradation of Methyl Violet Using Graphite/PbTiO ₃ Composite	C. Purnawan ¹ , S. Wahyuningsih ² , V. Nawakusuma ²
JCC2017301	Synthesis and Characterization of Bismuth Oxide using Sol Gel Method	Yayuk Astuti ¹ , Darul Amri ¹ , Krisna Dian Purnama ¹ , Fauzan Musthafa ¹ , Agus Muslim ¹ , Arnelli ¹
JCC2017302	Ascorbic Acid Encapsulation in Silica Gel from Teos/Mtes Precursor by Sol-Gel Process	Sriyanti ¹ , Sriatun ¹
JCC2017303	Method of ERASI (Electro Assisted Phytoremediation-Aeration) with Vetiver Grass (Vetiveria Zizanioides L) As Remediation of Heavy Metal Waste Fe and Cu	Iis Setianingrum ¹ , EgaDwi Sintadani ¹ , Vivin Viani ¹ , Durrotul Uuliyah ¹ , Muhammad FaiqFaridani ² , Rudy Syah Putra ³
JCC2017304	Identification of Flavonoid Compounds from the Active Fraction of the α -Glucosidase Inhibitor from Carrot Leaves Extract (Daucus carota L.)	Khairul Anam ¹ , Fatikha Aulia Said ¹ , Dewi Kusrini ¹
JCC2017305	A New Sorbent of Silica Magnetite: The Influence of Variation of Sodium Silicate Concentration on The Character of The Silica Magnetite	C Azmiyawati ¹ , S Farnola ¹ and A Darmawan ¹
JCC2017306	Effect of Potentials and Electric Charges Copper and Indium Depositions to The Photocurrent Responses of CuInS ₂ Thin Film Fabricated By Stack Electrodeposition Followed by Sulfurization	Gunawan ¹ , Abdul Haris ¹ , Hendri Widiyandari ² , Wilman Septina ³ , Shigeru Ikeda ⁴
JCC2017307	Synthesis of 4-hydroxy-3-methylchalcone from Reimer-Tiemann Reaction Product and Its Antibacterial Activity Test	Mutiara Hapsari ¹ , Tri Windarti ¹ , Purbowatiningrum ¹ , Ngadiwiyanah ¹ , Ismiyarto ¹
JCC2017308	Antiglycation and α -Glucosidase Inhibitory Properties of Alpiniapurpurata K Schum Fermented by Aspergillus niger	Agustina L. N. Aminin ¹ , Ratnasari ¹ , Meiny Suzery ¹ , Bambang Cahyono ¹
JCC2017309	Synthesis and Characterization of NaCo(1-x)MnxO ₂ Solid Electrolyte Using Sol-Gel Method: The Effect of Milling Speed Variations	Linda Suyati ¹ , Oksita Asri Widiyanti ¹ , Muhammad Qushoyyi ¹ , Rahmad Nuryanto ¹
JCC2017310	The Impact of Template Types on Poly Eugenol to The Adsorption Selectivity of Ionic Imprinted Polymer (IIP) Ion Metal Fe	Muhammad Cholid Djunaidi ¹ , Abdul Haris ¹ , Pardoyo ¹ , Rosdiana K ¹
JCC2017311	Antidiabetic Activity from Cinnamaldehyde Encapsulated by Nanochitosan	Purbowatiningrum ¹ , Ngadiwiyanah ¹ , Enny Fachriyah, Ismiyarto, Bonita Ariestiani, Khikmah



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JCC2017312	Chitosan-Tripoly phosphate (CS-TPP) Synthesis through Cross-Linking Process: The Effect of Concentration towards Membrane Mechanical Characteristic and Urea Permeation	RetnoAriadi Lusiana ¹ , Anugrah Ricky Wijaya ² , Sri Juara Santosa ³
JCC2017313	Modifikasi Zeolit Alam dengan Fe(III) dan Aplikasinya Sebagai Adsorben Anion Klorida dan Karbonat	Suhartana ¹ , Emmanuella Sukmasari ¹ , Choiril Azmiyawati ¹
JCC2017314	The Effect of Ca/P Ratio to The Formation of β -TCP by Sol-Gel Method	Tri Windarti ¹ , Adi Darmawan ¹
JCC2017315	Isolation, Identification and Xanthine Oxidase Inhibition Activity of Alkaloid Compound from <i>Peperomia pellucida</i>	Enny Fachriyah ¹ , Khairul Anam ¹ , M. Alvien Ghifari ¹
JCC2017317	The Spectrophone®: Utilization of Android-base Smartphone to support handmade spectrophotometer	Resti Ujiningtyas ¹ , Evalisa Apriliani ¹ , Ismi Yohana ¹ , Lisa Afrilianti ¹ , Nur Hikmah ² , Capi Kurniawan ¹
JCC2017318	Degradation of Cr(VI) in Batik Liquid Waste Using Advanced Oxidation Processes	Tien Setyaningtyas ¹ , Kapti Riyani ¹ and Ende Hopsah Badriah ¹
JCC2017SSS	Implementation Of Project-Based Learning To The Ability Of Scriptural Literates On Highschool Student Class XI	Sri Susilogati Sumarti
JCC2017BBB	Development of ultrasonic-assisted extraction of antioxidant compounds from Petai (<i>Parkia speciosa</i> Hassk.) leaves	Buanasari
JCC2017MM M	Improvement the Youghurt Nutritional Value, Organoleptic Properties and Preferences by Spirulina (<i>Spirulina platensis</i>) Supplementation	Meiny Suzery ¹ , Hadiyanto ² , Heri Sutanto ³ , Yuliati Widiastuti ⁴ , Judiono
JCC2017SHR	Productive Liquid Fertilizer from Liquid Waste Tempe Industry as Revealed by Various EM4 Concentration	Sri Hartini ¹ , Fred Letsoin ² , A. Ign. Kristijanto ³
JCC2017DDH	Chiral separation of selected antifungal drug by capillary electrophoresis and high performance liquid chromatography	Dadan Hermawan, Suwandria, Uyi Sulaeman, Asmiyenti Djaliasrin Djalil, and Hassan Y. Aboul-Enein*
JCC2017AMF	Cryogel as an immobilized Support Material for the Development of Biosensors	A Fatoni
JCC2017KDN	The Catalytic Activity Of CoMo/USY On Deoxygenation Reaction Of Anisole In A Batch Reactor	Khoirina Dwi Nugrahaningtyas ¹ , Irma Fadhila Putri ¹ , and Eddy Heraldyl
JCC2017SUP	Bio-remediation of lead (Pb) from textile wastewater	Supartono
JCC2017SRA	Guided Cooperative Flipped Classroom Approach in Learning Molecular Orbital Theory	Sharipah Ruzaina Syed Aris



REG. CODE	Title	Author(s)
JCC2017PLS	Antifungal activity of crude extracellular chitinase from <i>Bacillus subtilis</i> B298 towards <i>Rhizoctonia solani</i>	P Lestari ¹ , Suyata ¹ and E Setiawan ¹
JCC2017WST	Comparison of Conventional and Microwave-assisted Synthesis of Benzimidazole Derivative from Citronellal in Kaffir lime oil (<i>Citrus hystrix</i> DC.)	W Warsito ^{1,2,*} , R Dwi Sapri ¹ , D Alkaroma ¹ , A Z Azhar ¹
JCC2017BCH	Characteristics of eugenol loaded chitosan-tripolyphosphate particles as affected by initial content of eugenol and their in-vitro release characteristic	Bambang Cahyono ¹ , Qurrotu A'yun ¹ , Meiny Suzery ¹ , Hadiyanto ² .
JCC2017AHW	Synthesis and application of coordination polymer of Zn-itaconate for CO ₂ adsorption	Atmanto Heru Wibowo



Hybrid Scaffolds of Biodegradable Polymers and Biomimetic Matrices for Tissue Engineering Applications

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Tissue engineering has been developed as a promising approach in treating diseases and injuries by combining cells, scaffolds and cell growth factors. Some engineered tissues have already been used in clinics. In tissue engineering approach, scaffolds are important for cell adhesion, proliferation, differentiation and assembly. Scaffolds can provide a variety of biochemical and biophysical cues to promote regeneration of functional tissues. Scaffolds should be biocompatible, biodegradable and bioactive. Biodegradable synthetic polymers such as poly(L-lactic acid) (PLLA), poly(glycolic acid)(PGA) and poly(DL-lactic-co-glycolic acid) (PLGA) and naturally derived polymers such as collagen have been used to prepare porous scaffolds for tissue engineering. Cell-derived extracellular matrices have also been used to prepare biomimetic scaffolds to control stem cell differentiation. We have developed a few types of porous scaffolds by using biodegradable polymers and extracellular matrices. The first type is hybrid scaffolds. Biodegradable synthetic polymers have high mechanical strength while collagen has excellent cell interaction. To combine the advantages of these two types of polymers, their hybrid scaffolds were prepared by forming collagen sponge or microsponges in the interstices or pores of the porous skeleton of synthetic polymers. PLGA-collagen hybrid sponges and meshes were prepared by this method. The hybrid scaffolds showed high mechanical property and excellent interaction with cells. The hybrid scaffolds were used for tissue engineering of dermal tissue, cartilage and bone. The second type of scaffolds is micropatterned scaffolds prepared by using pre-prepared ice particulates as a porogen material. Collagen porous scaffolds with concave microgrooves were prepared by using micropatterned ice lines as a template. The micropatterned scaffolds were used for 3D culture of rat L6 skeletal myoblasts. Highly aligned and multi-layered muscle bundle tissues were engineered by controlling the size of microgrooves and cell seeding concentration. Myoblasts in the engineered muscle tissue were well-aligned and had high expression of myosin heavy chain and synthesis of muscle extracellular matrix. The microgrooved scaffolds can be used for engineering skeletal muscle tissue. The third type of scaffolds is cultured cell-derived ECM scaffolds that were fabricated by culturing different cells in a template that can be selectively removed after cell culture. Mesenchymal stem cells (MSC), chondrocytes and fibroblasts were cultured in the template to prepare their respective ECM scaffolds. The ECM scaffolds supported cell adhesion, proliferation and tissue regeneration. Autologous scaffolds could be prepared with this method by using cells isolated from patients. Implantation of autologous ECM scaffolds using mouse model demonstrated the excellent biocompatibility of autologous scaffolds. The ECM scaffolds are useful for tissue engineering and stem cell research. Acknowledgement: This work was supported by JSPS KAKENHI Grant Number 15H03027.

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The Cultivation of Religious Characters in Chemical Science Learning

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Chemistry Depart of FMIPA UNNES

The cultivation of religious character values is not only the duty and responsibility of certain Subject Teachers, but should also be the duty and responsibility of all Subject Teachers including science teachers (chemistry). To instill the values of religious character chemistry learning materials can be integrated by *sunatullah* chemical law as *kauniyah* verse with the relevant Quranic *qauliyah* verse. Because the goal of learning targets is to take national examinations or school final exams, most science learning in schools only contains the concepts, theories, and the laws of science plus exercise questions, which are cognitive. The goal is to improve students' cognitive value only. Even in the RPP there are affective, psychomotor, and character values, in general it is only administrative for the purpose of obtaining teacher credit score or principal/supervisor need, not the need for evaluation of affective and psychomotor learning outcomes what else the evaluation of values. Learning science that inculcates the religious character implies the moral quality of a person who in his thoughts, attitudes and behavior is always based on the religious values he embraces, such as the nature of its *tauhid*, thank giving, honesty, trust, exemplary, discipline and never give up in trying.

Designing Molecular Switches: A Molecular Magnetism Approach

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Molecular magnetic compounds are an emerging class of functional materials that are of interest not only to advance fundamental knowledge but also for their applications in devices, displays and sensors. One of the most versatile types of molecular switches are spin crossover (SCO) complexes where the two magnetic states, high spin (HS) and low spin (LS) may be interconverted by a range of external stimuli including heat, pressure and light.¹⁾

Iron(III) spin crossover complexes are particularly attractive targets as the compounds are air stable and highly tunable.²⁾ In this area our group has been exploring tridentate N₂O ligands which maximize the supramolecular interactions between the Fe(III) SCO active centres.^{3),4)}

In this presentation two Fe(III) SCO systems will be discussed and we will demonstrate how careful design of the ligand and appropriate choice of the anion can lead to a system where SCO is abrupt with significant hysteresis near room temperature and systems that act as anionic sensors.

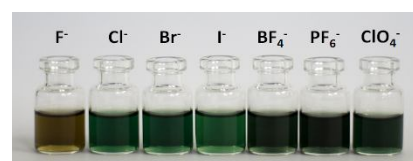
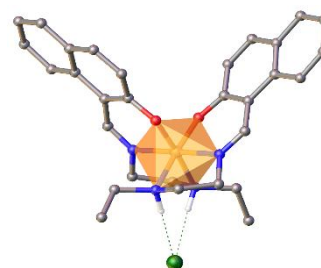


Fig. 1 Structure and solvatochromic behaviour of [Fe(naphEen)₂]Y.

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Strengthening The Academic Network on Bioresource Technology Research towards Green Industry

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Academic Networking in higher education is not only being done for education, but also will be needed to improve the research and community empowerment among academic society, government, and industry. Innovation on Research Based Learning (RBL) especially on biotechnology aspects will strengthening the academicians' competencies on education, research, and community empowerment. Biotechnology development for the next 2020 will be focused on molecular and cellular life sciences to create new invention and innovation in the field of medicine, agriculture, pharmacy, and many kind of industry. Indonesia consist of megabiodiversity of bioresources. Bioresource Technology is potential to be developed into an industry which opens opportunities to cultivate entrepreneurship. One of bioresource developments is conducted by using enzyme. Innovation on enzyme product has also been increase to its beneficial aspect for industrial application due to its green industry. Those are lipase, xylanolytic enzymes, cellulase, amylase, pectinase, etc. They use for food and beverage industry, pulp and paper, animal feed, detergents, bio-energy, and textile industry.

Bioresource processing industry in which enzyme applied can be run on large and small scale. This small scale industry is possibly carried by small and medium enterprises or individual as a sort of entrepreneurship. In this setting, students can learn entrepreneurship directly from the industry. The academic networking is not only provides opportunities for students to be involved in laboratory research, but also learn how to apply the research results into industry, as well as learn about business management. In this connection, industries and universities collaborate to create bioresource technology based industry. Further, students earn benefit in witnessing the passage of establishment such industry: starting from the research in the laboratory where enzyme is produced, the application of such research result into an industry, and learn how to run the business by learning entrepreneurship in that industry.

Keywords : *bioresource technology, enzyme, research based learning*

JCC2017006

Glycerol Steam Reforming for Hydrogen Production Over Ni/Co/NiCo/ZSM-5 Catalyst

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Steam reforming process is widely used for syngas production from natural gas. Syngas is consist of CH₄, H₂, CO₂ and CO.¹⁾ Hydrogen has many uses i.e. for ammonia production, fertilizer, methanol, gasoline, diesel, etc.²⁾ But, the availability of natural gas is limited. It needs potential raw material for producing hydrogen.

In this research, hydrogen was produced from glycerol by using steam reforming process. Ni/ZSM-5, Co/ZSM-5, and NiCo/ZSM-5 were used as a catalyst in hydrogen production. Steam reforming process was operated at high temperature and pressure using fixed bed reactor. The aim of this research is to know the best catalyst for hydrogen production. Hydrogen was produce from glycerol and water as a feed. The fed were put into the vaporizer for evaporation at 180°. After that, gasses fed were flowed to fixed bed reactor with bed thickness 2 cm.

Catalyst 5Ni/8Ni/12Ni/ZSM-5,
5Co/8Co/12Co/ZSM-5, and

5NiCo/8NiCo/12NiCo/ZSM-5 were used for hydrogen production. The gas products obtained are hydrogen, carbon monoxide, carbon dioxide and hydrocarbon. The composition of hydrocarbon gas varies according to the type of catalyst. But, propadiene gas was always produced. The highest hydrogen yield was obtained from 12Ni/ZSM-5 catalyst i.e. 85.31% with carbon dioxide yield 0.99% and produce carbon monoxide and hydrocarbon very low. 12Ni/ZSM-5 has the highest yield of hydrogen because nickel can direct the reaction to produce hydrogen.³⁾

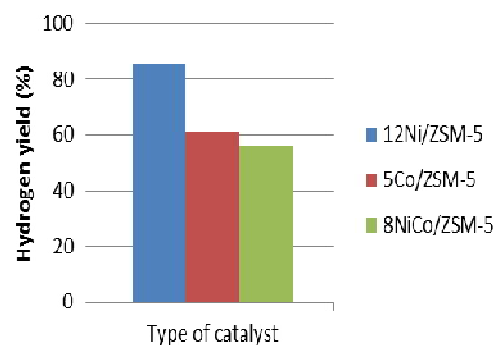


Figure 1. Hydrogen yield from Ni/Co/NiCo/ZSM-5 Catalyst

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JCC2017007

**FORMULATION AND ANTIFUNGAL ACTIVITY OF
OINTMENT TYPE OF M/A FROM ETHANOL EXTRACT OF
WHITE PLUMERIA LEAVES (*Plumeria alba* L.)
ON *Candida albicans***

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Candida albicans is one type of fungus that can cause many diseases infections. The fungal infection known as candidiasis and some people often suffer from skin candidiasis. The skin condition that easy to get sweat and humid are the factors that can caused the growth of fungi which is caused skin diseases. One of plant that can be used as an antifungal is white cambodia leaves (*Plumeria alba* L.). White cambodia ethanol extract contains active compound of alkaloids and saponins, to facilitate its use and get the maximum effect desired then white cambodia leaf extract is formulated into ointment preparations. The purpose of this research is to know the antifungal activity of white cambodia ethanol extract, the formulation of ointment and to know the characteristic ointment of white cambodia ethanol extract and to know its antifungal activity. The research begins with determination of minimum inhibitory concentration of white cambodia ethanol extract on *C. albicans*, then formulation of ointment. The ointments tested for their physical properties include homogeneity, pH, spreadability, protection ability, adhesive and hedonic and antifungal activity. The method used in determining KHTM and ointment activity test is hollow agar diffusion. The KHTM value of white cambodia ethanol extract was 5 ppm with a 1.22 mm inhibit zone. The ointment of white cambodia ethanol extract semisolid, white, distinctive, homogeneous, protected, has a pH of 5.07-5.59, spreading 5,09-5,78 cm, sticking power 1,00-2,33 seconds and antifungal activity ointment on day 0 for concentrations of 5, 10 and 15 ppm respectively of 2.93; 5.2 and 7.87 mm and on the 15th day for concentrations of 5, 10 and 15 ppm respectively of 3.68; 4.87 and 5.82 mm.



JCC2017008

Preparation and Physico-Chemical Properties of *Gracilaria*/PVA/GA/CNT-Based Hydrogel for Slow/Controlled Release Material

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Due to its application prospect, especially for slow/controlled release fertilizer, drug delivery, ion exchanger, and absorbent materials, hydrogel has been becoming an attractive material and being great interest of many scientists. However, the use of biodiversity-based hydrogels is still limited. In this study, we have synthesized a hydrogel from composites of *gracillaria* (GR), poly-vinylalcohol (PVA), glutaraldehyde (GA), and carbon nanotube (CNT) later then denoted as GR/PVA/GA and GR/PVA/GA/CNT for sample without and with CNT addition, respectively. In particular, two kinds of PVA (technical and pro analysis grades) were used in this study. The characterization of hydrogels was conducted by means of FTIR and SEM. Meanwhile, the performance parameters of hydrogels i.e. swelling ratio, water retention, and release behavior of potassium from hydrogel into aqueous media were carefully evaluated. FTIR spectra showed that the interaction of hydrogel components (GR, PVA, GA, CNT and K) involved some functional groups such as C-O, C-N, C=O, C-H sp³ and O-H which predominantly occurred through hydrogen bonding. Meanwhile, The SEM images confirmed that the hydrogels were porous like material. The swelling ratio of technical PVA-based hydrogel was higher than that of pro analysis one. Similarly, the hydrogel dried in incubator exhibited higher swelling ratio than that of dried without incubator. Additionally, the hydrogel demonstrated larger water retention. Insertion of CNT and K ions into hydrogel remarkably increased water retention. The hydrogel showed a typical slow release behavior for potassium ion. The release mechanism of K ions from hydrogel was supposed to start from the hydrogel surface into water media then is followed by the intrusion of water into hydrogel matrix which eventually exerted K ions from the inner part of hydrogel. It can be inferred that the synthesized hydrogel is promising to be applied as slow-controlled release material (S-CRM).

Keywords: hydrogel, gracilaria, poly-vynil alcohol, CNT, S-CRM.



JCC2017010

Dynamic adsorption of mixtures of Rhodamine B, Pb(II), Cu(II) and Zn(II) ions on composites chitosan-silica-polyethylene glycol membrane

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The adsorption of a solution mixture of Rhodamine B, Pb(II), Cu(II) and Zn(II) was studied using dynamic methods employing chitosan-silica-polyethylene glycol (Ch/Si/P) composite membrane as an adsorptive membrane. The composite Ch/Si/P membrane was prepared by mixing a chitosan-based membrane with silica isolated from rice husk ash (ASP) and polyethylene glycol (PEG) as a plasticizer. The resultant composite membrane was a stronger and more flexible membrane than the original chitosan-based membrane as indicated by the maximum percentage of elongation (20.5%) and minimum Young's Modulus (80.5 MPa). The composite membrane also showed increased mechanical and hydrophilic properties compared to the chitosan membranes. The membrane was used as adsorption membrane for Pb(II), Cu(II), Cd(II) ions and Rhodamine B dyes in a dynamic system where the permeation and selectivity were determined. The permeation of the components was observed to be in the following order: Rhodamine B > Cd(II) > Pb(II) > Cu(II) whereas the selectivity was shown to decrease the order of Cu(II) > Pb(II) > Cd(II) > Rhodamine B.



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ZrO₂/bamboo leaves ash (BLA) Catalyst in Biodiesel Conversion of Rice Bran Oil

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Preparation, characterization and catalytic activity of ZrO₂/bamboo leaves ash (BLA) catalyst for conversion of rice bran oil to biodiesel have been investigated. Catalyst was prepared by impregnation method of ZrOCl₂ as ZrO₂ precursor with BLA at theoretical content of 20% wt. followed by calcination. Physicochemical the properties of the catalyst material was characterized by x-ray diffraction (XRD), FTIR and surface acidity measurement. Activity test of materials in biodiesel conversion of rice bran oil over reflux method and microwave (MW) assisted method. Reaction variables studied in the investigation were the effect of catalyst weight and time of MW irradiation compared with the use reflux method. The results showed that ZrO₂/BLA catalyst exhibits competitively effective and efficient for the production of biodiesel. Reflux method demonstrated the higher conversion (%) compared to MW method but MW method showed the better reusable properties.

JCC2017016

Probing the Interaction between Cyclic ADTC1 (Ac-CADTPPVC-NH₂) Peptide with EC1-EC2 domain of E-cadherin using the Molecular Docking Method

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Deeply understanding the intermolecular interaction between molecules on the paracellular pathway in parts give insight to its microscopic and macroscopic properties. Previously, it was studied the interaction of ADTC5 (Ac-CDTPPVC-NH₂) peptide and EC1-EC2.1) In this research, it has been studied the interaction between synthetic cyclic ADTC1 (Ac-CADTPPVC-NH₂) peptide and EC1-EC2 domain of E-cadherin in part of paracellular pathway computationally using the molecular docking method. So, the aim of this research is to probe the effect of amino acid alanine (A) of ADTC1 on its interaction properties.

The study carried out in two steps. The first step, the optimization using GROMACS v4.5.6 program. The optimization was done for two types of ADTC1 peptide: open-cyclic (OC) and close-cyclic (CC) on 20,000 and 120,000 ps, respectively. The OC and CC affected by its distance constraints and force restraints. Then, the most stable resulted in by optimization on 20,000 ps and the force restraint 12,000 kJ.mol⁻¹nm⁻² applied to the optimization on 120,000 ps. The second step, to determine the interaction properties using AutoDock 4.2 program. The interaction was done for A-J box, and the best position of the binding site and binding energy on the OC and CC ADTC1 peptides against the EC1-EC2 domain of E-cadherin was selected. 2)

The result showed that the CC of the F box ADTC1 has the best interaction with binding energy of -26.359 kJ.mol⁻¹ and this energy lower than ADTC5 without Alanine amino acid. The ADTC1 interacts with EC1 of EC-EC2 on residues Asp1, Trp2, Val3, Ile4, Ile24, Lys25, Ser26, Asn27, and Met92. The active center is at residue Lys25 and Asn27.

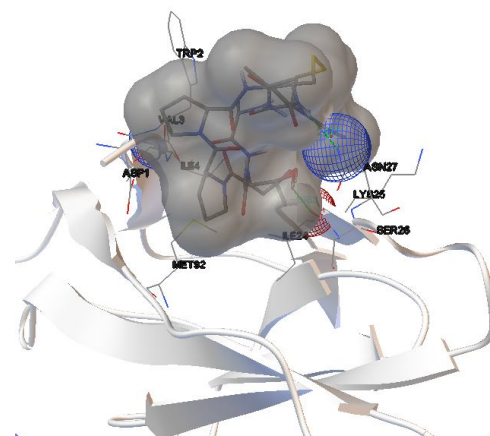


Fig. 1 The interaction between close-cyclic ADTC1 peptide and the EC1-EC2 domain of E-cadherin.

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JCC2017022

**Increasing character value and conservation behavior through
integrated ethnoscience chemistry learning (a case study in the
department of science Universitas Negeri Semarang)**

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The purpose of this study was to obtain a factual picture of the improvement of students' conservation character and conservation behavior through the application of integrated ethnoscience chemistry learning. This research was a case study on students majoring in the Department Of Science Mathematics and Natural Science Faculty Universitas Negeri Semarang. The subjects of the study were 30 students attending ethnoscience course in one of the teacher education institutions in the even semester of the academic year of 2016/2017. The subjects were given chemistry learning integrated into ethnoscience foreign weeks. The technique of data collection was done by using attitude scale arranged based on Likert scale. The data were analyzed by using qualitative descriptive. The results showed that the integrated ethnoscience chemistry learning contributed positively to the improvement of the character value and conservation behaviour.

Keywords: ethnoscience, character value, conservation behaviour



JCC2017025

Synthesis and Characterization of Diranitidinecopper(II) Sulfate Dihydrate

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The complex of ranitidine with Cu(II) has been synthesized in 1:2-mole ratio of metal to the ligand in water. The forming of the complex was indicated by shifting of maximum wavelength from 816 nm (CuSO₄·5H₂O) to 626 nm (the complex). Infrared spectra indicated NO₂ and NH functional group were coordinated to Cu(II). The percentage of copper in the complex measured by Atomic Absorption Spectroscopy (AAS) analysis was 7.5% indicating that formula of the complex was Cu(ranitidine)₂SO₄(H₂O)_n (n=2, 3 or 4). The electrical conductivity of Cu(II) complex in water was 71.0 Scm²mol⁻¹ corresponding to 1:1 electrolytes. Thermogravimetric/Differential Thermal Analysis (TG/DTA) showed the presence of two molecules of H₂O in the complex. UV-Vis spectra showed a transition peak on 15974 cm⁻¹ indicating square planar geometry. The complex was paramagnetic with μ_{eff} 1.77 BM. The proposed formula of the complex was [Cu(ranitidine)₂]SO₄·2H₂O.



JCC2017028

Synthesis and Characterization of SrO/Zeolite Nanoparticle as Catalysal Transesterification Reaction of Used Cooking Oil

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The synthesis of SrO/zeolite nanoparticles, zeolite nanoparticles had been synthesized from *Tetraethyl orthosilicate* (TEOS) as precursors of SiO₂ and *aluminum isopropoxide* (AIP) as Al₂O₃ precursors. Zeolite nanoparticles were synthesized with aging for 3 days and hydrothermal for 6 days. SrO/zeolite nanoparticles were synthesized from the impregnation process and characterized using X-Ray Diffraction (XRD), Fourier Transform Infrared (FTIR), and Surface Area Analyzer (SAA). Result of XRD characterization of zeolite nanoparticle obtained by type of zeolite faujasit. Zeolite nanoparticles had an angle of 2 θ smaller than 10, and was 17,4887 nm based on the Scherrer equation of XRD results. In synthesis of SrO/zeolite nanoparticle result of impregnation process obtained the highest crystallinity at 8% *loading* catalyst. The absorption peak at 1052,08 cm⁻¹ was the asymmetric spacing vibration and 722.25 cm⁻¹ which was a symmetric spacer vibration. The interaction between SrO and H-zeolite nanoparticles showed a wave numbers shift of 1055.5 cm⁻¹ and the appearance of new absorption bands at 2342.95 cm⁻¹. The result of SAA characterization by surface area analysis showed that the increasing loading of SrO/zeolite nanoparticles reduced the catalyst surface area, supported by a peak of 2 θ better than each catalyst. The SEM analysis results showed that the zeolite morphology was varied and each plate was micro size.



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JCC2017036

Development of Assessment Instruments to Measure Critical Thinking Skills

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Assessment instruments that is commonly used in the school generally have not been orientated on critical thinking skills. The purpose of this research is to develop assessment instruments to measure critical thinking skills, to test validity, reliability, and practicality. This type of research is Research and Development. There are two stages on the preface step, which are field study and literacy study. On the development steps, there some parts, which are 1) instrument construction, 2) expert validity, 3) limited scale tryout and 4) narrow scale tryout. The developed assessment instrument are analysis essay and problem solving. Instruments were declared valid, reliable and practical.



JCC2017037

Application of Sodium Ligno Sulphonate As Surfactant In Enhanced Oil Recovery and Its Feasibility Test for TPN 008 Oil

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One of Enhanced Oil Recovery (EOR) methods is using surfactants to reduce the interfacial tension between the injected fluid and oil in old reservoir. The most important principle in enhanced oil recovery process is the dynamic interaction of surfactants with crude oil. Sodium Ligno Sulphonate (SLS) is a commercial surfactant and already synthesized from palm solid waste by other researcher. The aim of this work was to apply SLS as surfactant for EOR especially on TPN 008 oil from Pertamina Indonesia. In its application as an EOR's surfactant, SLS shall pass feasibility test like IFT, thermal stability, compatibility, filtration, molecular weight, density, viscosity and pH test. The feasibility test was very important for a preliminary test before another advanced test. The results demonstrated that 1% SLS solution in formation water (TPN 008) have 0,254 mN/M IFT value and also great in thermal stability, compatibility, filtration, molecular weight, viscosity and pH test.

JCC2017061

Treatment of Waste Lubricating Oil by Chemical and Adsorption Process Using Butanol and Kaolin

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Treatment of waste lubricating oil by chemical and adsorption process using butanol and kaolin has been done. Quality of lubricating oil after treatment was analysis using Atomic Absorption Spectrophotometer (AAS) and Gas Chromatography-Mass Spectrometry (GC-MS). The effects of the treatment of butanol, KOH and kaolin to heavy metals and organic compounds in waste lubricating oil treatment have been evaluated. Treatment of waste lubricating oil has been done using various kaolin weight, butanol and KOH solution. The result of this research show metal content of Ca, Mg, Pb, Fe and Cr in waste lubricating oil before treatment are 1020.49, 367.02, 16.40, 36.76, 1,80 ppm, respectively. Metal content of Ca, Mg, Pb, Fe and Cr in the waste lubricating oil after treatment are 0.17, 9.85, 34.07, 78.22, 1,20, respectively. Optimum condition for treatment of waste lubricating oil using butanol, KOH and kaolin are 30 mL, 3.0 g and 1.5 g, respectively. Waste lubricating oil after treatment or new lubricating oil the content of organic compounds is 1-hydroxy-3-pentyne, butanol, 2-methyl-3-heksanon, 1,2-dimethyl hidrazyne, 2-hydroxy-1,3-propaneyl ester, and hexadecanol.

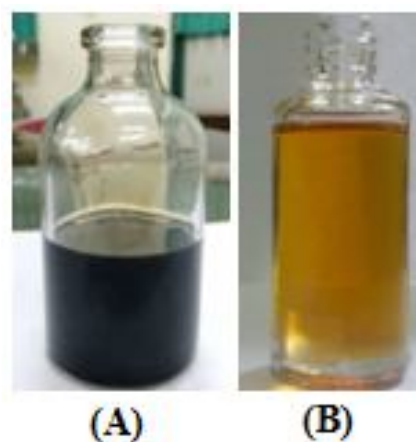


Fig 1. Color change waste lubricant oil (A) before and (B) after treatment by chemical and adsorption process using butanol and kaolin

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JCC2017062

The Effect of Temperature and Time in The Manufacture of Gelatin Powder from Waste Fish Scales as A Source of Food Protein Towards National Food Security

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Indonesia is a maritime country which has a water area of 5.9 million km², comprising 3.2 million km² territorial waters and 2.7 million km² of exclusive economic zone waters. In the processing of marine products in Indonesia, the processing of raw materials waste is being a concern at this time, one of which is waste of fish scales. One product that can be produced from fish scales is gelatin. Gelatin is one type of protein obtained from natural collagen hydrolysis found in the skin, bones and scales. Collagen protein content in fish scales will be hydrolyzed to form gelatin. The purpose of this research is to know the effect of NaCl addition in demineralization process to the quality of gelatin lizardfish which has been produced, to know the influence of reaction temperature in the demineralization process and drying to the quality of gelatin flour produced, and to know the influence of time needed in the demineralization process and drying in the manufacture of gelatin flour from waste of fish scales. The expected outcome of this research is optimization function of waste resulting of the processing of seafood by demineralization process of gelatin from fish scales, scientific publications, and also scientific journals accredited by Dikti. The method used in this study is the demineralization method to eliminate the content minerals content in the scales then extraction to convert collagen in scales into gelatin. After that data obtained are analyzed by physicochemical analysis of gelatin produced include water content test, pH, viscosity, gel strength, melting point, gel point, white degree, and ash content.



JCC2017063

Two Bisabolanes from *Curcuma xanthorrhiza* Rhizomes and Their Antibacterial Activity

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Curcuma xanthorrhiza (Zingiberaceae) is one of Indonesian herbs used in the traditional medicines, and known to have a number of biological activities, such as anti-inflammatory, hepatoprotector, anticancer, antioxidant, and antimicrobial. Phytochemical study on the *C. xanthorrhiza* rhizome showed that its contain two major compounds, namely diarylheptanoids and terpenoids^{1,2}). In this research, the isolation of terpenoids from rhizomes of *C. xanthorrhiza* and their antibacterial activity have been conducted.

The terpenoids were isolated by using vacuum liquid chromatography and radial chromatography. The structures of the compounds were determined based on spectroscopic data (NMR 1D & 2D, and MS). The antibacterial activity was carried out by using microdilution method against several bacteria, i.e. *Bacillus subtilis*, *Enterobacter aerogenes*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Salmonella typhi*, *Shigella dysenteriae*, *Staphylococcus aureus*, and *Vibrio cholerae*.

Two sesquiterpenes have been isolated from *C. xanthorrhiza* rhizomes and were identified as bisabolanes sesquiterpenes namely ar-curcumene and xanthorrhizol. Xanthorrhizol demonstrated high antibacterial activitiy against *B. subtilis* and *S. aureus* with MIC values of 3.9 and 7.8 µg/mL, and MBC values of 3.9 and 7.8 µg/mL, respectively. ar-Curcumene was potensial as antibacterial agent due to its MIC and MBC values relatively low.

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JCC2017064

A Comparison Study of Sodium Lignosulfonate, Sodium Dodecyl Benzene Sulfonate, and Sodium p-Toluene Sulfonate Surfactant for Enhanced Oil Recovery

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Sodium Lignosulfonate (SLS) surfactant was successfully synthesised by applying batch method using lignin from oil palm empty fruit bunches as precursor. The synthesised SLS surfactant was characterised by using Fourier Transform Infrared (FTIR) spectroscopy. Furthermore, its performance in reducing interfacial tension of crude oil and formation water emulsion was analysed by using compatibility test, phase behaviour study, and interfacial tension (IFT) measurement, which then compared with two commercial surfactants called as Sodium Dodecyl Benzene Sulfonate (SDBS) and Sodium p-Toluene Sulfonate (SpTS). The result shows that the performance of SLS surfactant was better than SpTS surfactant with the value of 1.67 and 3.59 mN/m, respectively. Meanwhile, SDBS surfactant shows the best performance with the IFT value of 0.47 mN/m.



JCC2017065

Optimization Recovery Yttrium Oxide (Y_2O_3) In Precipitation, Extraction and Stripping Process

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Yttrium oxide can be used as a dopant control rod of nuclear reactors in YSH material¹) and superconductors.²) Yttrium oxide is obtained from the processing of xenotime with rare earth elements (REE) dominant Y, Dy, and Gd whose content about 29.53%, 7.76%, and 2.58%. The presence of impurities in the yttrium oxide may affect characteristic of material and the efficiency in its use, thus it needs to be separated by precipitation and extraction-stripping and calcination in the making of the oxide. However, to obtain higher levels of Yttrium oxide, it is necessary to determine the optimum conditions in its separation. The purpose of this research is to determine the optimum pH of precipitation, determine acid media and concentration optimum in extraction and stripping process and determine the efficiency of the separation of Y from REE. This research was conducted with pH variation in the precipitation process that pH is 4 - 8, the variation of acid media for the extraction process ie HNO₃, HCl and H₂SO₄ with each concentration of 0.5 M; 1 M ; 1.5 M; and 2 M and for stripping process are HNO₃, HCl and H₂SO₄ with each concentration of 1 M; 2M; and 3 M, determine the efficiency of the separation of Y from REE. Based on the result of research, the optimum precipitation process is pH 6.5, the optimum extraction is HNO₃ 0.5 M and stripping is HNO₃ 3 M and the efficiency of precipitation process at pH 6.5 is 69.53 %, extraction process 96.39% and stripping process 40.50% with purity of Yttrium oxide is 92.87%.

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JCC2017069

The Effect of Mole Comparison of Acetone as Co-Solvent to Methanol in Transesterification Reaction of Waste Cooking Oil

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The production of biodiesel from waste cooking oil by transesterification reaction using acetone as co-solvent has been carried out. This research studied the optimal mole ratio of acetone as co-solvent to methanol in the transesterification process using homogeneous alkaline catalyst KOH 1% (w/w) of waste cooking oil in room temperature for 15 minutes of reaction time. Mole ratio of used cooking oil to methanol is 1:12. Acetone was added as co-solvent in varied mole ratio to methanol are 1:4, 1:2, and 1:1, respectively. The results of methyl esters were analyzed using GC-MS instrument. The results showed that the optimal ratio is 1:4 with 99,93% of methyl esters yield.



JCC2017073

Antimicrobial Activity of Saponin Compounds from Oil-Free Mahogany Seeds (*Swietenia macrophylla*, King)

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Mahogany seeds contains many compounds that's called secondary metabolites, i.e flavonoid, alkaloid, and saponin. One of the natural ingredients, saponin.that can be used as an antimicrobial agent. This study aims to determine the antimicrobial activity of saponin compounds from oil-free mahogany seeds. Antimicrobial activity against *Escherichia coli* (E.coli) and *Bacillus cereus* (B.cereus) bacteria. Extraction was done by maceration method with n-Hexane and Methanol. Antimicrobial activity test using the absorption method. The results showed that the isolates had antimicrobial activity and gave the clear zone against both of E. coli and B. cereus bacteria, with value Inhibitory Regional Diameter 12.85 mm and 16.30 mm respectively. Based on the results of the study it can be concluded that saponin compounds from oil-free mahogany seeds had antimicrobial activity against E.coli and B. cereus bacteria.



JCC2017074

Generic Science Skills Enhancement of Students Through Implementation of IDEAL Problem Solving Model On Genetic Information Course

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This study aims to enhance generic science skills of students through implementation of IDEAL problem solving model on genetic information course. Method of this research was mixed method, with pretest-posttest nonequivalent control group design. Subjects of this study were chemistry students enrolled in biochemistry course, consisted of 22 students in the experimental class and 19 students in control class. Instrument in this study was essay involves 6 indicators generic science skills (i.e. indirect observation, causality thinking, logical frame, self- consistent thinking, symbolic language, and developing concept), observation sheets, student worksheets and questionnaire of student responses. The results showed that genetic information course using IDEAL problem solving model have been enhance generic science skills in low category with <g> of 20,93%. Based on <g> and observation result for each indicator, showed that there is no indicators of generic science skills classified in the high category. Next, for student worksheets showed 4 indicators of generic science skills classified in the high category were indirect observation, causality thinking, self- consistent thinking, and symbolic language. The last for questionnaire of student responses result showed 3 indicators of generic science skills classified in the high category were logical frame, symbolic language, and developing concept.

JCC2017079

Sunlight-Assisted Synthesis of Colloidal Silver Nanoparticles Using Chitosan as Reducing agent

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An environmentally friendly colloidal silver nanoparticles preparation using chitosan as reducing agent has been studied. It develops a new strategy on preparation of silver nanoparticles through the gel phase using sodium hydroxide (NaOH) as accelerator reagent. Sunlight irradiation was employed to assisted reducing process of silver ions to silver nanoparticles. Localized surface plasmon resonance (LSPR) phenomenon of silver nanoparticles was investigated using UV-Vis spectrophotometer. The shape and size of silver particles were analyzed using TEM. The formation of silver nanoparticles was confirmed by the appearance of LSPR absorption peak at 396.0–412.0 nm. The absorption peak of LSPR were affected by NaOH amount, time of sunlight irradiation and concentration of AgNO₃. The produced silver nanoparticles were spherical with dominant size range of 5 to 8 nm as shown by TEM images. All colloids were stable without any aggregation for 30 days after preparation.

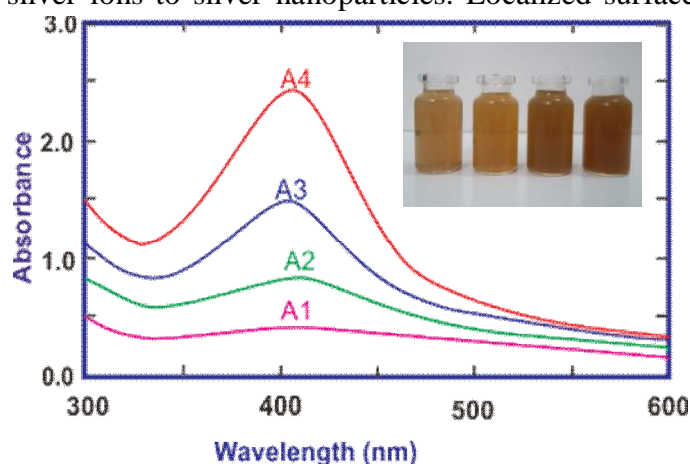


Fig. 1 The UV-visible spectra of colloidal silver nanoparticles prepared at different AgNO₃ concentration



JCC2017083

Modification of Polyeugenol Dirivate Contain Ethylene Glycol Dimethacrylate (EGDMA) as a Carrier for Phenol Trasport

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The ethylene glycol dimethacrylate (EGDMA) is crosslinking agents which can be used to extend the polymer chain and increase the active side. This paper describes the evaluation of Polymer Inclusion Membrane (PIM) containing the derivatives of polyeugenol as carrier with respect to the physical properties of carrier and the optimization of phenol transport. The polymerization results between eugenol and EGDMA is copoly(eugenol-ethylene glycol dimethacrylate, co-EEGDMA). Subsequently the synthesized polymer is used as a carrier for phenol transport using PIM method. The optimization parameters performed are the effect of pH on the source phase, the NaOH concentration in the receiving phase, and the influence of transport time. The result was performed by looking at the physical properties of carrier including rendemen, melting point and solubility, then characterization of carrier and membrane were performed using FT-IR and SEM. The result of analysis and characterization proves that copolymerization between crosslinking agent and eugenol has resulted in new compound which is a polyeugenol derived compound. Furthermore, the results of transport optimization also proves that the polyeugenol derivative compound has the ability as a carrier compound for transport of phenol. The PIM method in this study has successfully transported phenol at a pH of the source phase are 4.5 to 5.5 with a receiving phase concentration of between 0.25 M - 0.5 M and the optimum co-EEGDMA transport time of 64 hours of 70.5%.



JCC2017086

Determination of Urease Biochemical Properties of Asparagus Bean (*Vigna unguiculata ssp sesquipedalis* L.)

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Urease is enzyme that plays a role in nitrogen metabolism during plant germination. Plants that produce a lot of urease are grains. This study used asparagus bean as source of urease. The purpose of this research is to learn the effect of germination time on the activity of urease enzyme from asparagus bean and its biochemical properties. The research was started by germination of asparagus bean on day 2, 4, 6, 8, 10 and 12. asparagus bean sprouts were extracted using acetone and separated by centrifugation to obtain the crude extract of urease. The biochemical properties of the crude extract of urease was further determined including: the effect of temperature, pH, substrate concentration, and metal addition to urease activity. The urease activity is determined by the Nessler method. The germination time of asparagus bean in yielding urease enzyme reached the optimum activity on the 8th day with activity value of 593,7 U / mL. The biochemical properties of urease from asparagus bean have optimum activity at 35 oC, pH 7.0 and substrate concentration 0.125% with activity value of 600 U / mL. Addition of CaCl₂, SnCl₂ and ZnCl₂ metals decrease the activity of urease.



JCC2017088

Concentration Effect of Silver Doped Titania Synthesized by Sonochemical Method and Ability Test of Anti Bacterial S. Aureus

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Nano Silver doped-titania particles are widely used as anti-bacterial material. Ag-TiO₂ powder was synthesized by sonochemical method with TiO₂ source of Tetra Titanium Isopropoxide (TTiP) and Ag source of silver nitrate. The composition of Ag doping was made by varying the mole ratio of 2-6% solution of silver nitrate and TTiP. The test results of X-ray diffractometer (XRD) showed that the synthesized particles have anatase polycrystalline structure with a dominant diffraction field (101) and the addition of Ag produces its own structure phase. The test results Ag-TiO₂ photocatalytic under 10 watt of UV light for 2 hours has been able to reduce the bacteria *E. coli* up to 100% and *S. aureus* bacteria by 90%. The results showed that the photocatalytic nano-TiO₂ particles of Ag is very effective as an anti-bacterial material especially in wastewater.



JCC2017092

Membran-Based Synthesis of Chitosan Crosslinked Succinic Acid Grafted with Heparin/Pva-Peg (Polyvinyl Alcohol-Polyethylene Glycol) and its Characterization

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The reaction of crosslinking and grafting are required to modify the functional group of Chitosan in order to increase the number of active groups of Chitosan. This research conducted an experiment on the crosslink reaction of succinic acid and the graft reaction of heparin on Chitosan so that this material can function as a hemodialysis membrane candidate. Sharing the mole ratio between Chitosan-succinic acid was made to obtain the best composition from the modified material. By blending PVA-PEG, all modified materials were made as a membrane and were characterized. The characterization test includes the thickness, weight, *water uptake*, pH resistance, tensile strength and hydrophilicity of the membrane. The result showed that the best membrane composition occurred in the addition of succinic acid = 0.011 gram. It was proven by its highest mechanical strength that could not be found in other membranes.



JCC2017098

Characterization of Bio-Oil from Fast Pyrolysis of Palm Frond and Empty Fruit Bunch

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As the world's biggest producer of palm oil, 105.16 million tons of palm frond and 16.94 million tons of empty fruit bunch (EFB) were produced annually in Indonesia. These two kinds of palm biomass were still in low-application and could potentially give rise to major environmental problems. Instead of being piled up as waste, lignocellulosic biomass (in this study palm frond and EFB) can be converted into biofuel through fast pyrolysis. Prior to pyrolysis, biomass feedstocks were characterized their component and elemental compositions, moisture content and higher heating value (HHV). Fast pyrolysis processes were conducted at a temperature of 350 °C using thermal oil heater as heat carrier. The gas phase from pyrolysis was condensed and produced bottom layer called bio-oil. As GC-MS data shows, the bio-oil from both feedstocks was dominated by acetic acid, furans, phenols, aldehydes, and ketones. The Higher Heating Value (HHV) was reported 12.19 and 26.49 MJ/kg, while moisture content were 41.91 and 11.54 wt % for bio-oil from palm frond and EFB, respectively.



JCC2017101

Encapsulation of Vitamin C and Beta Carotene in Sesame (*Sesamum Indicum* L.) Liposomes

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In this study sesame liposomes were used to encapsulate both vitamin C and beta-carotene en bloc. Liposomes were also prepared with addition of cholesterol. The encapsulation efficiency of sesame liposomes for vitamin C in the present of beta-carotene was 71.53%. Addition of cholesterol increased the encapsulation efficiency. The highest was 89.28% obtained in liposomes with 20% cholesterol. Contrary to that the highest beta-carotene encapsulation efficiency, 80.89%, was found in the sesame liposomes prepared without cholesterol. It seemed cholesterol increased the efficiency of vitamin C encapsulation, but decrease the efficiency of beta-carotene encapsulation. The decrease in beta-carotene encapsulation efficiency is possibly due to competition between cholesterol and beta-carotene to reside in the liposomal bilayer membrane.

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JCC2017103

Synthesis and Characterization of Eugenol-Stearyl acrylate Biopolymer

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Renewable natural resources had been using in synthesis polymer materials and it had been attracted attention. One of renewable materials that could be used was eugenol found in clove oil. Abundance of eugenol had have used yet optimally. The value of eugenol should to be increased by modifying with other materials; alkyl acrylate. Alkyl acrylate had a sponge structure and had a high swelling degree to oils. The novelty in this research was made an eugenol-alkyl acrylate biopolymer. The purpose was made the biopolymer as a material that could be alternative solution on handling oil spill. In this research, synthesis eugenol-alkyl acrylate biopolymer was did by using cationic polymerization method with sulfuric acid as initiator for 4 hour at room temperature. The success of synthesis was conducted using IR characterization that shown by disappear of wave number at 1630 cm⁻¹. This indicated the breaking of C=C bonding, while in ¹H-NMR characterization did not show chemical shift at 5-5.3 ppm was chemical shift from vinyl functional groups (C=C).



JCC2017108

Study of Catalyst Variation Effect in Glycerol Conversion to Hydrogen by Steam Reforming Process

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Along with the world economy development, needs of energy being increase too. This increasing of energy needs doesn't supported by a good amount of the energy source which is from the fossil materials, so the availability of energy is insufficient to satisfy human needs. Hydrogen is a compound which has many usages in petrochemical industry. Beside that, hydrogen is an environmentally friendly fuel. But, hydrogen production use natural gas as raw material which is getting used up along with the time. Therefore, an alternative energy is needed to produce hydrogen.^{1,3)}

Glycerol is one compound which can be use as raw material of hydrogen production.^{1,3)} Glycerol is a byproduct of biodiesel production process which is less utilized maximally and if not handled properly it can pollute the environment. By using glycerol as the raw material of hydrogen production, we can get the added value of glycerol as well as can be an energy source solution.^{1,3)} The process of hydrogen production by steam reforming is a thermochemical process that can produce up to 70% efficiency, but generally this process still needs catalyst contribution to improve its efficiency.

In this research will be examined the effect of catalyst types variation such as Natural Zeolite catalyst 1:15 HCl ratio, 2Zn/ZSM-5, 2M Calcined Natural Zeolite, ZSM-5, Natural Zeolite 0.5M, Ultrasonic Natural Zeolite, and will be studied the effect of temperature as operating condition and observe the influence of feed ratio to hydrogen production process. From the research results, the highest yield of hydrogen gas is in the gas production process by Natural Zeolite catalyst 1:15 HCl ratio with 54,97%. Then sequentially, 2Zn/ZSM-5 with 53,60%, 2M Calcined Natural Zeolite with 45,86%, ZSM-5 with 30,17%, 0,5M Natural Zeolite with 18,26%, and Ultrasonic Natural Zeolite with 17,17 %. This result shows that the catalyst variation affects the hydrogen gas yield product.

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JCC2017118

Extraction of Gelatin from Catfish Bone Using NaOH and its Utilization as a Template on Mesoporous Silica Alumina

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Gelatin extraction from catfish bone using NaOH and its utilization as a template on synthesis of mesoporous silica-alumina had been investigated. The extraction was prepared by immersing 25 g catfish bone in 125 mL of NaOH in concentration of 0.0; 0.05; 0.10; 0.15 and 0.20 M for 24 h, then washing with demineralized water, followed by immersed the bone into 125 mL of 1 M HCl for 1 h, then washed using demineralized water into pH 5. To produce gelatin the bone was refluxed with 100 demineralized water at 70°C for 5 h, then evaporated at 50°C. The gelatin was characterized using FTIR and electrophoresis (SDS-PAGE). The best performance of gelatin was produced by NaOH 0.10 M. The gelatin consists of amide A, I, II, III and molecular weight less than 47 kD. Silica-alumina was prepared using silica and alumina extrated from Lapindo mud. 6 g of SiO₂ and 2 g of NaOH was immersed in 62 mL of demineralized water then added with alumina solution (0,204 g alumina in 30 mL demineralized water). The gelatin solution (5 g gelatin in 70 mL demineralized water) was dropped into the silica-alumina while stirring at 50°C for 4 h and aging for 24 h. The synthesized silica alumina was analysed using FTIR and surface area analyzer.

The FT-IR spectra indicated the Si-O-Si and Al-O-Al vibration at wave number of 1049.28 and 1103.23 cm⁻¹. The synthesized silica-alumina showed mesoporous characters with pore diameter of 41.18 nm and surface are of 32.76 m²/g.



JCC2017122

2,4,6-Trimercapto-1,3,5-Triazine - Modified Gold Nanoparticles in Colloidal System and Its Potency as Formalin Detector

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Stabilized gold nanoparticles (AuNPs) have been successfully synthesized using a modifier of 2,4,6-trimercapto-1,3,5-triazine (TMT) ligand. TMT has three thiol groups and nitrogen atoms on the aromatic ring that can interact and stabilize AuNPs. TMT - modified AuNPs (AuNPs/TMT) were characterized using UV-Vis spectrophotometer, particle size analyzer (PSA) and transmission electron microscopy (TEM). The characterization showed that AuNPs/TMT stable at maximum wavelength (λ_{max}) of 537 nm with particle size of 10.99 nm. Increased acidity (pH) of colloid result the protonated thiol groups in TMT observed from a visual change of AuNPs/TMT colloid from purple to blue cause weakening of AuNPs-TMT bond. In this study, AuNPs/TMT colloid was investigated with formalin. Its interaction shows that AuNPs/TMT has potency as a practice detector for formalin, observed from particle size change, λ_{max} shift and color change of colloid.



JCC2017123

Synthesis of N-doped ZnO Thin Film by Sol-gel Method and Its Photodegradation Activity to Coliform Bacteria Under The Visible Light Irradiation

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The most rivers on the city have some bad conditions that are colored, bad odor, and sometimes full of trash which causes by house activities or industrial activities. They throw their waste into the river and contaminate it with chemical compounds and bacteria. The presence of bacteria especially coliform in the water indicate that the water contains intestinal waste which originated from human's feces or animal carcasses. Photodegradation is one of the solutions to reduce bacteria in the water that using photocatalytic materials irradiated under the light. N-doped ZnO is a photocatalytic material that can degrade microorganism or chemical compounds in the water. N-doped ZnO material made by sol-gel method using isopropanol as the solvent and deposited on a glass substrate as a thin film on the temperature of 500 °C. The aim of this research is to degrade bacteria in the water of river under solar radiation for 3 hours with the variations of treatment condition are photodegradation with ZnO thin film, with N-doped ZnO thin film, and photodegradation without the thin film. The bacteria which measured as parameter are E. coli and total coliform bacteria. As the results, N-doped ZnO can reduce the most presence of bacteria than the other treatments. It reduces the number of E. coli from 5800 units/100 mL into 500 units/100 mL and also the number of total coliform bacteria from 11300 units/100 mL into 5000 units/100 mL.



JCC2017125

Analysis Study of Stevioside and Rebaudioside A from Stevia rebaudiana Bertoni By Normal Phase SPE and RP-HPLC

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Solid Phase Extraction (SPE) method using silica as sorbent for stevioside and rebaudioside A analysis in *Stevia rebaudiana* Bertoni leaf have not been performed. The aim of this study is to develop SPE method using silica as sorbent for Reverse Phase-High Performance Liquid Chromatography (RP-HPLC) analysis of stevioside and rebaudioside A compounds in *S. rebaudiana* leaf. The results of this study indicate that the optimal conditions for normal phase SPE (silica) are conditioned with 3.0 mL of hexane. The sample loading volume is 0.1 mL. Cartridge is eluted with 1.0 mL acetonitrile: aquadest (80: 20, v / v) to separate both analytes. The cartridge is washed with chloroform and aquadest of 0.3 mL respectively. The developed SPE sample preparation method meets the accuracy and precision assurance and can be used for the analysis of stevioside and rebaudioside A by RP-HPLC.



JCC2017126

**A Green route fast synthesis and characterization of
2,4,6-triacetyl-1,3,5-trihydroxybenzene: an analogue of
acylphloroglucinol natural product**

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Phloroglucinol is one of the phenolic compounds and has been investigating in light of its biological activity against various microorganisms including bacteria, fungi, and peronosporomycetes. In an attempt to discover new lead compounds with higher toxicity, a green route fast synthesis of 1,1',1''-(2,4,6-trihydroxybenzene-1,3,5-triyl)triethanone trihydroxybenzene or triacetylphloroglucinol (TAPG) is described. It was prepared from commercially available phloroglucinol by a solvent-free, metal and halogen-free Friedel-Crafts acylation using acetic anhydride and phloroglucinol with biodegradable catalyst methanosulfonic acid (MSA) in one step reaction under nitrogen atmosphere. The reaction was done at 80 °C for 45 minutes and was controlled by a thin layer chromatography and purified by column chromatography and gave a colorless needle crystal in up to 72% yield with melting point 145 °C. Structure elucidation of the synthesized compound was based on FTIR and ¹HNMR.



JCC2017219

Sorption Isotherm Modelling Of Fermented Cassava Flour by Red Yeast Rice

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Abstract. The objective of the study is to determine the characteristic of moisture sorption isotherm from fermented cassava flour by red yeast rice using various modelling. This research used 7 salt solutions and storage temperature of 298K, 303K, and 308K. The models used were Brunauer-Emmet-Teller (BET), Guggenheim-Anderson-de Boer (GAB) and Caurie model. The monolayer moisture content was around 4.51 – 5.99% db. kb value of GAB model was around 0.86-0.91. c value of GAB model was around 4.67-5.97. C value of BET was around 4.83-7.04. Whereas the c value in Caurie model was around 1.25-1.59. The equilibrium and monolayer moisture content on fermented cassava flour by red yeast rice was decreasing as increasing temperature. GAB constant value indicated that the process of moisture absorption on the fermented cassava flour by red yeast rice categorized in type II.

JCC2017131

Synthesis of a New Materials of Silica-Methyl Quaternary Ammonium-Magnetite Nanoparticles and Its Applications as Adsorbent of Cu(II) in Aqueous Solution

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In this research, effect of pH and contact time of copper(II) on silica modified with silica-methyl quaternary ammonium (SMQA) coated magnetite nanoparticles material prepared from row material of rice husk ash has been investigated. Additionally, its application an effect of pH and contact time were carried out and to determine by atomic adsorption spectrometry (AAS). This adsorbent were synthesized from SMQA, coated with magnetite and characterized by SEM-EDX (Scanning Electron Microscope), FTIR (Flourier Transform Infrared), TEM image and XRD (X-ray diffraction). The experimental condition was optimized in batch process to achieve the maximum efficiency. The result showed that optimum pH 7 and mass of adsorbent 0.1 g. The maximum capacity SMQA-magnetite obtained 28.82 mg g⁻¹. Peack of FTIR spectra obtained silanol, siloxane, amine groups with wavenumber were 1080, 1636 and 1528 cm⁻¹ respectively. The characteritic of 2θ = 35.67 was magntetite (Fe₃O₄).

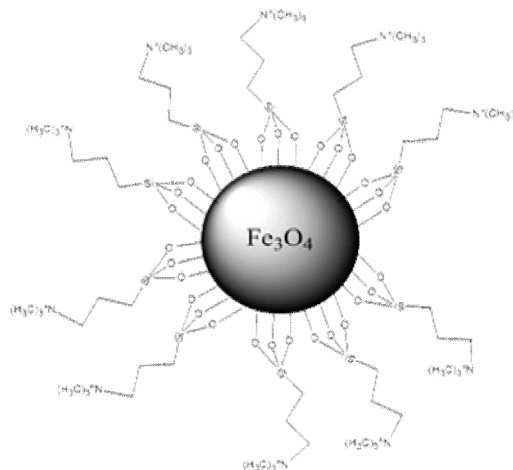


Fig. 1 Models of Mag-SMQA

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JCC2017134

Development of Intertextual Learning Strategy with Guided Inquiry on Solubility Concept to Improve the Student's Scientific Processing Skills

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The aim of this study was to develop intertextual learning strategy with guided inquiry on solubility concept to enhance student's scientific processing skills. This study was conducted with consideration of some various studies which found that lack of student's process skills in learning chemistry was caused by learning chemistry is just a concept. The method used in this study is a Research and Development to generate the intertextual learning strategy with guided inquiry. The instruments used in the form of sheets validation are used to determine the congruence of learning activities by step guided inquiry learning and scientific processing skills with aspects of learning activities. The development of learning strategy was using intertextual relationships in the guided inquiry learning steps to improve the student's scientific processing skills.



JCC2017135

Synthesis and Characterization of Tetrakis(2-amino-3-methylpyridine)copper(II) Sulfate Tetrahydrate

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The complex of Tetrakis(2-amino-3-methylpyridine)copper(II) sulfate tetrahydrate has been synthesized in a ratio of 1: 6 metal to ligand in methanol. The percentage of copper in the complex measured by Atomic Absorption Spectrometer (AAS) showed the complex formula was $\text{Cu(2-amino-3-metilpyridine)}_4\text{SO}_4(\text{H}_2\text{O})_n$ ($n = 3, 4, \text{ or } 5$). The analysis of TG/DTA showed that 1 mole of complex contains 4 moles of H_2O . The conductivity measurement indicated that the complex is in 1 to 1 electrolyte. The formula of the complex was estimated as $[\text{Cu(2-amino-3-metilpyridine)}_4]\text{SO}_4 \cdot 4\text{H}_2\text{O}$. The complex was paramagnetic with μ_{eff} of 1.85 BM. The UV-Vis spectra showed a band peak at 730 nm with an electronic transition $E_g \rightarrow T_{2g}$. IR spectral data indicated that the functional groups of N-pyridine 2-amino-3-metilpyridine coordinated to ion Cu(II) . The geometry of the complex was probably square planar.



JCC2017139

Utilization of Hidrotalcite modified with 3,4,5-Trihydroxybenzoic Acid for the Treatment of Silver-Containing Waste Water

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Utilization of hydrotalcite modified with 3,4,5-trihydroxybenzoic acid as a medium for the treatment of silver-containing wastewater has been done by using adsorption method. The modified hydrotalcite was prepared by direct precipitation using Mg and Al metals precursor and an organic compound of 3,4,5-trihydroxybenzoic acid. The modified material was then used for the treatment of silver-containing wastewater through adsorption method together with the determination of adsorption capacity, kinetics study as well as the material characterization after the treatment process. It could be observed from the results that the adsorption of silver onto the modified hydrotalcite was in accordance with Langmuir adsorption model with the adsorption capacity (q_{\max}) of 400 mg.g^{-1} . Moreover, the adsorption kinetics of the treatment showed that the process followed the kinetics model of pseudo-second-order of Ho with the velocity constant (k) of $1.15 \times 10^{-4} \text{ g.mg}^{-1}.\text{minute}^{-1}$. The adsorption process exhibited an exergonic property with the adsorption energy of $28.10 \times 10^3 \text{ J.mol}^{-1}$. All of the adsorption processes were conducted in the condition of $\text{pH}_{\text{adsorption}} = 3$. Meanwhile, results from the characterization using FTIR showed the functional groups of $\text{C}=\text{C}$, $-\text{OH}$ and NO_3^- on the modified hydrotalcite underwent some alteration after the adsorption process of Ag(I) . Therefore it can be observed that the functional groups of COOH and OH had an important role in the adsorption of silver from wastewater.



JCC2017144

Turpetin oil isomerization with TCA/natural zeolite catalyst using microwave irradiation

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The catalytic potential of TCA/Natural Zeolite in the isomerization of turpentin oil was investigated. The purpose of this study is to investigate the influence of the power of microwave on concentration of product and activity and selectivity of catalyst. The main products were camphene, α -terpinene, limonene, p-cymene, terpinene, and terpinolene. The highest selectivity was 28.26% with a conversion of 23.25%, whereas the higher conversion was 98.99% with selectivity of 16.90% at room temperature using power of microwave 640 W.

Keywords: α -pinene, isomerization reaction, microwave



JCC2017149

Preliminary Study of *Hyptis pectinata* (L.) Poit Extract Biotransformation by *Aspergillus niger*

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One alternative approach in order to increase the content of bioactive compounds is fermentation. *Hyptis pectinata* (L.) Poit is a plant that can be found in tropical area and potentially as anticancer, anti-inflammatory, insect repellent, antiviral and antioxidant. In this research, efforts have been made to increase bioactive plant capacity of *Hyptis pectinata* (L.) Poit through submerged fermentation using *Aspergillus niger*. The study performed by adding methanol extract of *Hyptis pectinata* (L.) Poit on two conditions, that is added at the beginning of fermentation and while entering phase of death. *Aspergillus niger* growth rate in both conditions was observed by determining the dry weight of cells every 24 hours. The pattern of extract transformation was observed since the addition of the first day in the death phase by the TLC method. The results show that the addition of *Hyptis pectinata* (L.) Poit extract at the beginning of growth triggers the cells to grow faster, whereas the addition at the end of the death phase precisely accelerates cell death. TLC profile shows the emergence of new compounds suspected as the products of transformation of extract of *Hyptis pectinata* (L.) Poit on day 8 after addition of extract.



JCC2017155

Toxicity Tests, Antioxidant Activity, and Antimicrobial Activity of Chitosan

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Chitosan is a naturally occurring cationic biopolymer, obtained by alkaline deacetylation of chitin. Due to its biodegradable, antimicrobial, biocompatible, has advantages in biomedical and food industry applications. The aim of this research is to investigate the toxicity, antioxidant activity and antibacterial activity of chitosan from shrimp chitin. In this study, chitin was first extracted from shrimp waste material through demineralization, deproteinization, and decolorization. Chitin is then deacetylation with 60% NaOH so that chitosan produced. Degrees of deacetylation, molecular weight, toxicity test, antioxidant activity and antimicrobial activity of chitosan then evaluated.

Toxicity test had been done that used Brine shrimp (Brine shrimp lethality test). Brine shrimp lethality test shows that lethality level of *Artemia Salina* (L) that value of Lethal Concentration 50% (LC₅₀). The antioxidant analysis was performed using DPPH method (2,2-diphenyl-1-picrylhydrazyl) and FTC method (ferric thiocyanate) in which the radical formed will reduce Ferro to Ferri resulting in a complex with thiocyanate. To determine the antibacterial activity in *Staphylococcus aureus* and antifungal in *candida albicans* by measuring antimicrobial effects and minimum inhibitory concentrations (MIC). Based on the result of research, the value of degrees of deacetylation, molecular weight, and LC₅₀ values of chitosan of synthesis was 72.76, 1052.93 g/mol and 1364.41 ppm, respectively. In general, the antioxidative activities increased as the concentration of chitosan increased. Chitosan inhibited the growth of *S. aureus* bacteria at 10 ppm. MIC value of chitosan against *C. albicans* was 1.56%.

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JCC2017157

Encapsulation of Iron and Vitamin C in Coconut (*Cocos Nucifera* L.) Liposomes: Efficiency and Leakage

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Liposomes from coconut phospholipids (*Cocos nucifera* L.) were used to encapsulate Fe (II) and vitamin C. In this study, we explored the influence of cholesterol and temperature on the encapsulation efficiency and the liposomes leakage. To prepare the liposomes we mixed cholesterol with coconut phospholipids in the ratio as follows 0%, 11%, 25%, 43%, and 67%. The highest encapsulation efficiency was obtained in the coconut liposomes with 43% cholesterol, i.e. 65% for Fe (II) and 59% for vitamin C. During 8 days storage at 5 °C, 25 °C, and 37 °C it was found that the minimum leakage was occurred at 5 °C for the coconut liposomes with 43% cholesterol. This study indicates that cholesterol increases the efficiency of coconut liposomes for encapsulating iron and vitamin C and decreases their leakage.

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JCC2017165

Effectiveness Study of Drinking Water Treatment In Indonesian Regulation of Health Minister Using Adsorbent Clays Appeal Andisol In Lariat Heavy Metal Cadmium (Cd) and Bacterial Pathogens

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Water is a natural resource that is essential for all living creatures. In addition, water is also one root cause of disease affecting humans. The existence of one of heavy metal pollutants cadmium (Cd) in the body of water is an environmental problem has a negative impact on the quality of water resources. Adsorption is one of the ways or methods that are often used for the treatment of waste water into clean water. Allophane clays are used as adsorbent of Cd metal with batch method. Water purification technology using ceramic filters used to reduce the content of Cd in the water. This study aims to determine the effect of the composition of clay and Andisol, activation temperature and contact time on the adsorption capacity of Cd in the solution of the model; The optimum adsorption condition and the effectiveness of drinking water treatment in accordance Indonesian regulation of health Minister using clay adsorbents appeal Andisol in lariat heavy metals Cd and bacterial pathogens. Identification and characterization of adsorbent is done by using NaF, Infrared Spectroscopy (FTIR), X-ray diffraction (XRD), specific surface area and total acidity specific. Cd metal concentrations were analyzed by atomic absorption spectroscopy. Adsorption isotherms determined by Freundlich and Langmuir equation. Modified water purification technology using ceramic filters are made with a mixture of clay and Andisol composition. The results showed samples of clay and Andisol containing minerals. The optimum condition of adsorption achieved at 200°C activation temperature, contact time of 60 minutes and the adsorbent composition of 60: 40% versus Andisol clay. Freundlich isotherm represents of Cd adsorption on the adsorbent clays and Andisol with a coefficient of determination (R^2) (0.99) and constant (k) (1.59), higher than Langmuir ($R^2=0.89$). The measurement results show the water purification technology using ceramic filters effectively reduce bacterial coliform and Cd content in the water.



JCC2017166

Radical Scavenging Activity from Ethanolic Extract of Malvaceae Family's Flowers

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Sea hibiscus flower (*Hibiscus tiliaceus* L.), shoe flower (*Hibiscus rosa-sinensis* L.), and turk's cap flower (*Malvaviscus arboreus* Cav.) are a plant that belongs to the same family, Malvaceae. There are expected contain of anthocyanins as active compound. Several studied shows that some flowers could protect human body from free radical danger exposure. This study has been done to examine ethanolic extract from malvaceae family's which has potency as radical scavenger. Antiradical activity assay was determined by DPPH method with IC₅₀ value as parameter. Based on the study the malvaceae family's flower was contain of tannins, polyphenols, saponin, and anthocyanine. The radical scavenging activity respectively from the lowest to the highest activity are vitamin c (4,05 ppm \pm 0,094), Turk's cap flower (6,80 ppm \pm 0,22), shoe flower (14,62 ppm \pm 0,104) and sea hibiscus flower (38,8 ppm \pm 0,086). The three of the extract was having strong antioxidant activity.



JCC2017167

Golden Wattle (*Acacia pycnantha*) Flower: Is it Only Floral Emblem of Australia?

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Acacia pycnantha, commonly known as the golden wattle, belongs to the Fabaceae family. Typically, it grows from 3 to 8 meters in height, and is native to New South Wales, Victoria, and South Australia.¹ Despite their bright colourful flowers, and that it is regarded as Australia's national flower, there are no reports on the structures present within the flower. Therefore, we present the phytochemical constituents in the flower, as well as correlations to their biological activities. The crude methanol were subjected to liquid-liquid extraction to provide hexane, ethyl acetate, and residual fractions. RP-HPLC profiles of both the ethyl acetate and residual fractions produced similar profiles. Thus, the ethyl acetate fraction was selected, and subjected to HPLC separation. Utilising the optimized preparative HPLC method, eight known compounds were isolated, and identified as (2*S*)-isohemiphloin (**1**), (2*S*)-naringenin-5-*O*-glucoside (**2**), kaempferol 3-rutinoside (**3**), quercetin 3-glucoside (**4**), myricetin 3-rhamnoidise (**5**), kaempferol-3-rhamnoside (**6**), isosalipurposide (**7**), naringenin (**8**) by comparison of their spectral data with those reported in the literature. Furthermore, the extract and all isolated compounds were assessed for antibacterial activities against several human pathogenic bacteria by Hit-confirmation method with various results.

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JCC2017169

Electrochemical Disinfection of Coliform and Escherichia Coli for Drinking Water Treatment By Electrolysis Method Using Carbon Electrode

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Disinfection of coliform and E.Coli in the water has been performed by electrolysis using carbon electrodes. Carbon electrodes were used anode and cathode with a purity of 98.31% based on SEM-EDX analysis. This study was conducted using electrolysis powered electric field by carbon electrode as the anode and cathode. Electrolysis method used variations of time (30, 60, 90, 120 minutes at voltage 5 V) and voltage (5, 10, 15, 20 V for 30 minutes) to determine the effect of the disinfection of bacteria.

The results showed the number of coliform and E.coli in water before and after electrolysis was 190 and 22 MPN/100 mL, respectively. Based on the Standards Quality Drinking Water No. 492/Menkes/Per/IV/2010 show content of coliform and E.Coli must be zero. Electrolysis with variation of time and potential can reduce of the number of coliforms and E.Coli but was not in accordance with the standards. The effect of hydrogen peroxide (H_2O_2) to the electrochemical disinfection was determined using UV-Vis spectrophotometer. The levels of H_2O_2 formed increased as soon after the duration of electrolysis voltage but was not significant influence to the mortality of coliform and E.coli.

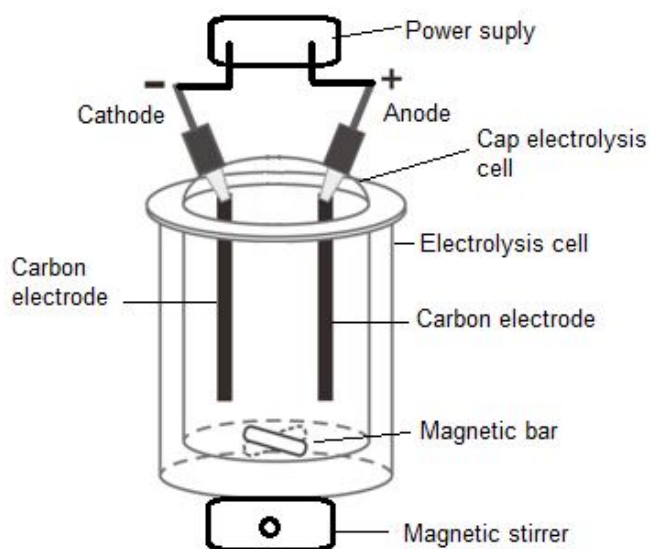


Fig. 1 Scheme of electrochemical disinfection and its equipment.

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JCC2017172

Prenylation of Pinostrobin and Antibacterial Activity Against Clinical Bacteria

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Chemical transformation has been performed through a prenylation reaction of pinostrobin (**1**) which is the main component of *Kaempferia pandurata* rhizome. Five compounds have been obtained from the prenylation reaction, i.e monooxyprenylated pinostrobin (**2**), monooxyprenylated chalcone (**3**), diprenylated chalcone (**4**), triprenylated chalcone (**5**), triprenylated cyclohexene chalcone (**6**). The identification of those compounds were determined based on NMR data and mass spectra analysis. The five compounds showed moderate antibacterial activity against clinical bacteria, namely *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli*, and *Pseudomonas aeruginosa*.



JCC2017178

Simple Approach in Understanding Interzeolite Transformations Using Ring Building Units

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Recently, there are two general approaches used in understanding interzeolite transformations, thermodynamically represented by framework density (FD)^{1,2)} and kinetically by structural building units.^{1,2,3,4)} Two types of structural building units are composite building units (CBU's) and secondary building units (SBU's). This study aims to examine the approaches by using interzeolite transformation data available in literature and propose a possible alternative approach. From a number of cases of zeolite transformation, the FD and CBU approach are not suitable for use. The FD approach fails in cases involving zeolite parents that have moderate or high FD's, while CBU approach fails because of CBU's unavailability in parent zeolites compared with CBU's in their transformation products. The SBU approach is most likely to fit because SBU's are units that have basic form of ring structures and closer to the state and shape of oligomeric fragments present in zeolite synthesis or dissolution cases.^{5,6)} Thus, a new approach can be considered in understanding the interzeolite transformation, namely the ring building unit (RBU) approach. The advantage of RBU approach is RBU's can be easily derived from all framework types, but in SBU approach there are several types of frameworks that cannot be expressed in SBU forms. In addition, there have no relationships in several transformations involving framework types with single SBU, compared with RBU approach can overcome. Based on the results, the RBU can be considered in selecting suitable zeolite parents and predicting the alternatives of framework types in interzeolite transformations.

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JCC2017179

The Effect of Mangoosteen Extract (*Gracinia Mangostana* L.) on Synthesis of Ag_3PO_4 Photocatalyst

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Today, silver orthophosphate has been developed as photocatalyst for dye removal under visible light irradiation due to owing small-band gap energy of ~ 2.42 eV (1), strong photooxidative (2,3) and high quantum yield (3). The morphology and composites design have been applied to improve this photocatalyst. Morphology of saddle-like tetrahedron (4), coral-like microspheres (5), branched Ag_3PO_4 crystal with porous structure (6) and truncated tetragonal bipyramids (7) had improved the photocatalytic activity.

The big challenge of Ag_3PO_4 development is improvement the surface area and stability of photoreaction. The photocatalytic activity of Ag_3PO_4 is strongly affected by the size and surface area (8). Previous work showed that the synthesis of Ag_3PO_4 using PEG and PVP increased the specific surface area and enhanced the photocatalytic activity (9). Most of the preparation of Ag_3PO_4 catalyst using co-precipitation method resulted in low surface area. The poor performance of Ag_3PO_4 is attributed to the large particle size, which results in a low surface area, and thus low photocatalytic activity. Therefore, the development of the Ag_3PO_4 synthesis to design the small particle size is very important.

Herein, the Ag_3PO_4 prepared under mangoosteen (*Gracinia mangostana* L.) extract addition to the starting solution of AgNO_3 and $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$ could significantly decrease the particle size and increase the crystalline of Ag_3PO_4 . This result enhances the photocatalytic activity. The mangoosteen extract solution of 0%, 1% and 1.5% were applied to producing the Ag_3PO_4 using the starting material of AgNO_3 and $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$. Samples were characterized using x-ray diffraction and scanning electron microscopy. Photocatalytic activities were evaluated using Rhodamine B photooxidation under blue light irradiation. The mangoosteen extract addition greatly decreases the particle size and increases the crystallinity of Ag_3PO_4 which significantly enhances the photocatalytic activity.

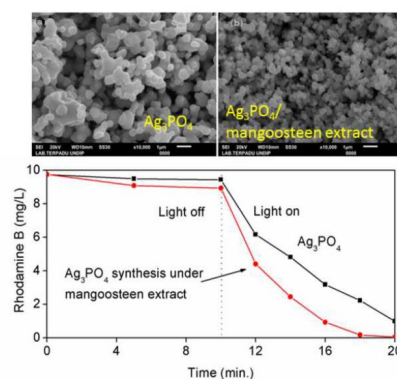


Fig. 1 Morphology and Catalytic Activity

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JCC2017185

Transformation of Indonesian Natural Zeolite into Analcime Phase under Hydrothermal Condition

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Natural zeolite is abundantly available in Indonesia and well distributed especially in the volcano area like Java, Sumatera, and Sulawesi. So far, natural zeolite from Klaten, Central Java is one of the most interesting zeolites has been widely studied. This research aims to know the effect of seed assisted synthesis under a hydrothermal condition at 120 °C for 24 hours of Klaten's zeolite toward the structural change and phase transformation of the original structure. According to XRD and XRF analysis, seed assisted synthesis through the addition of aluminosilicate mother solution has transformed Klaten's zeolite which contains (mordenite and clinoptilolite) into analcime type with decreasing Si/Al ratio from 4.51 into 1.38. Morphological analysis using SEM showed the shape changes from irregular into spherical looks like takraw ball in the range of 0.3 to 0.7 micrometer. Based on FTIR data, structure of TO₄ site (T = Si or Al) was observed in the range of 300-1300 cm⁻¹ and the occupancy of Brønsted acid site as OH stretching band from silanol groups was detected at 3440-3650 cm⁻¹. Nitrogen adsorption-desorption analysis confirmed that transformation Klaten's zeolite into analcime type has decreased the surface area from 55.41 to 22.89 m²/g and showed inhomogenous pore distribution which can be classified as micro-mesoporous aluminosilicate materials.



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JCC2017189

Ar-Turmerone a Sesquiterpenoid from *Curcuma Soloensis*.Val (Temu Glenyeh) Rhizome Extract

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Ar-turmerone a sesquiterpenoid was isolated from *Curcuma soloensis* Val. (*temu glenyeh*) rhizome extract. Isolation was carried out by extraction, fractionation and purification. The fractionation and purification of the compound were carried out by using chromatography methods. The identification of its compound was determined by spectroscopic techniques that included 1D-NMR (¹H NMR, ¹³C NMR), and 2D-NMR (HSQC, HMBC).



JCC2017193

Identification and Control of Unknown Impurity in Trimetazidine Dihydrochloride Tablet Formulation

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Trimetazidine dihydrochloride is an anti-ischemic metabolic agent which is used as drug for angina pectoris treatment.¹⁾The drug substance monograph is available in European Pharmacopoeia²⁾ and British Pharmacopoeia³⁾, while the drug product is non-compendial. During development of trimetazidine dihydrochloride tablet formulation, we found an increase of unknown impurity during preliminary stability study. The unknown impurity was identified by LC-MS and its molecular weight was matching with N-formyl trimetazidine (m/z 295). Further experiments were performed to confirm the identification result by injecting the impurity standard and spiking formic acid into the product. The result showed that the retention time of unknown impurity was similar to the standard and the impurity increased along with increasing concentration of formic acid. The proposed mechanism of impurity formation is via amidation of piperazine moiety of trimetazidine by formic acid which presents as residual solvent in one of the excipients used in the formulation. Subsequently, the impurity in our product was controlled by choosing the primary packaging which could minimize the formation of impurity.

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JCC2017197

Modifications of Deoxynojirimycin (DNJ) Compound as α -Glucosidase Inhibitor for the Dengue Fever Treatment

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Dengue fever, a disease which is caused by dengue virus (DENV), has become a serious public health concern worldwide especially in tropical and subtropical region countries, effectively put half of the world's population at risk with approximately 390 million cases are occurred each year. To date, there is no effective treatment for this disease yet. And so, the urgency to find the new treatment for dengue fever is inevitable. Until now, the development of antiviral agents has been focused by directly target the key enzyme from DENV. However, some alternatives have been developed recently, such as by inhibiting the host cells that play a major role in the viral life cycle of DENV. α -glucosidase is a well-known host enzyme which is responsible for the glycosylation process of DENV envelope protein (E), pre-membrane (prM) protein and non-structural 1 (NS1) protein. Thus, the α -glucosidase has become an ideal target for the development of new antiviral agents of DENV. In this research, the modification of Deoxynojirimycin (DNJ) has been performed to find a better α -glucosidase inhibitor by adding one or more functional groups at the compounds, resulting in a total of 406 ligands in the process. These ligands were screened through molecular docking simulation to find the best ten ligands which have the highest binding affinity based on the free binding energy ($\Delta G_{\text{binding}}$) and binding interactions. After then, a series of drug scan and toxicity prediction were conducted as well to obtain the best three ligand modifications. In the end, we concluded that AL4-SP169, AM3-SP169 and CA2-OSL-9511 are the best ligands modifications.



JCC2017198

5-Substituted Isatin Derivatives: Synthesis and Anti-tubercular Activity Against *Mycobacterium tuberculosis* H37Rv

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One of the most frequent and widespread infectious diseases especially in developing countries is tuberculosis (TB).^{1,2,3)} A major public health problem that threatens progress made in TB care and control worldwide is anti-TB drug resistance, and particularly dangerous forms are multidrug-resistant TB.^{4,5,6)} The aim of this research was to synthesize a series of isatin derivatives from the reactions of isatin or 5-substituted isatin or 5,7-dibromoisatin with 2-thiophenecarboxylic acid hydrazide under acidic conditions, and to find the structure-activity relationships of the series against *Mycobacterium tuberculosis* H₃₇Rv. The product with dibromo substituted showed positive inhibiting against *M. tuberculosis* H₃₇Rv.

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JCC2017199

Formulation of Antibacterial Liquid Soap from Nyamplung Seed Oil (*Calophyllum inophyllum* L) with Addition of *Curcuma heyneana* and its Activity Test on *Staphylococcus aureus*

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The increasing demand of soap encourages new innovations of its quantity, quality, benefits and raw materials. One of the innovations that have been developed is the use of nyamplung (*C. inophyllum* L) seed oil as basic ingredients of soap, with an addition of active substances such as antibacterial and fragrance. This research aims to determine the best formulation of liquid soap according to SNI 06-4085-1996 and its antibacterial activity after addition of n-hexane fraction of *C. heyneana* rhizome and fragrance from lavender (*L. angustifolia*) flower oil at various concentrations, then a hedonic test was conducted to evaluate the panelist's preference towards the soap with the best formulation. This research has been done through several stages of soap making with saponification method, soap characterization according to SNI 06-4085-1996, determination of best formulation of liquid soap based on the effectiveness index method and antibacterial activity test of liquid soap to *S.aureus* with disc diffusion method and hedonic test using some parameters such as colour, odor, foam, clean power and effects after being used. The results showed that the best characteristic soap according to SNI 06-4085-1996 was a soap with 0.2% antibacterial content and 2.5% perfume. The best soap characteristic showed total fatty acid 67.49%, free fatty acid 1.01%, neutral fat 7.24%, a weight of type 1.05 g/mL, pH of 9.85 and foam stability 76.69%. The results of the antibacterial activity test of the best formula soap showed the inhibitory zone of 14.92 mm.



JCC2017200

Synthesis, Characterization, and Application of Novel Zn(II)-Ionic Imprinted Polymer for Preconcentration of Zn(II) Ions From Aqueous Solution

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A new Zn(II)-ionic imprinted polymer has been prepared via precipitation polymerization using 8-hydroxyquinoline (8HQ) as a ligand, methacrylic acid (MAA) as functional monomer, and ethyleneglycoldimethacrylate (EGDMA) as a cross-linker has been prepared. The benzoyl peroxide and ethanol/acetonitrile (2:1) mixture were used as initiator and porogen, respectively. The Zn-IIP was characterized by Fourier transform infrared spectrophotometry (FT-IR) and scanning electron microscopy (SEM). The synthesized Zn-IIP was used as a new adsorbent for solid phase extraction (SPE) of Zn(II) prior flame atomic absorption spectrometry (FAAS) determination. The experimental parameters for SPE extraction, such as pH of the sample, loading rate, and elution volume, have been optimized. The optimum pH for quantitative Zn(II) retention was 5.5, and the elution was completed with 2 mL of 1.0 mol L⁻¹ nitric acid. The optimum loading rate was 0.5 mL min⁻¹. The recovery of Zn(II) from solution samples after its SPE extraction on IIP with 50-fold theoretical preconcentration was 94.60-104.50%.



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JCC2017203

Chitosan as Natural Coagulant to Minimize Hg (II) Levels in Bone River Waters of Gorontalo Province

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This study was aimed to apply chitosan product from waste of shrimp shell as natural coagulant which is environmentally friendly to minimize heavy metal Hg in the waters. The results of qualitative and quantitative analysis of watershed water samples around PETI activity showed positive Hg (II) of 2.04 ppb. The most prospective chitosan is then applied to the water sample. The results of this study showed a decrease in Hg to 1.13 ppb with a removal efficiency of metal Hg (II) 55.392%. It can be concluded that chitosan from waste of shrimp shell can minimize Hg (II) levels in PETI waters of Bone Bolango River of Gorontalo Province.



JCC2017206

Adsorption Kinetics of Sodium Lauryl Sulfate (SLS) and Hexadecyltrimetilammonium Bromide (HDTMABr) Surfactants on Activated Carbon

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Research on the adsorption of both cationic and anionic surfactants using activated carbon as well as the investigation of the adsorption isotherms and adsorption kinetics has been conducted. The results showed that the adsorption of SLS by activated carbon was Langmuir adsorption isotherm while its adsorption kinetics showed second order pseudo with the adsorption rate constant was $2.23 \times 10^3 \text{ gm}^{-1}\text{hour}^{-1}$. Meanwhile, HDTMA-Br adsorption by activated carbon showed that the isotherm adsorption tended to follow isotherm Freundlich and was second order pseudo with the adsorption rate constant was $89.39 \text{ gm}^{-1}\text{hour}^{-1}$.



JCC2017207

The Effect of Cellulose Acetate Concentration from Coconut Nira on Ultrafiltration Membrane Characteristics

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Cellulose acetate is one of material in produce ultrafiltration membrane. Many efforts have been done to produce cellulose acetate from natural product to replace commercial one. In this research, ultrafiltration membrane has been produced from coconut flower water (nira). ultrafiltration membrane is widely used in separation processes. This research aims to determine the characteristics of ultrafiltration membrane at a various concentration of cellulose acetate. The ultrafiltration membrane is conducted by phase inversion method at various concentration of cellulose acetate. The cellulose acetate concentration was 20%, 23% and 25% (w/w) with formamide as additives. The results showed that the greater the concentration of cellulose acetate, the smaller the flux value. The highest flux was a membrane with 20% cellulose acetate concentration with water flux value 55.34 L / (m². hours). But the greater the concentration of cellulose acetate the greater the rejection. The highest rejection value was on a membrane with 25% cellulose acetate concentration of 82.82%. While from the tensile strength test and the pore size analysis, the greater the cellulose acetate concentration the greater the tensile strength and the smaller the pore size



JCC2017212

Supramolecular Assembly of Group 11 Phosphorescent Metal Complexes for Chemosensors of Alcohol Derivatives

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Transition metal complexes with phosphorescent properties have been utilized as chemical sensors (chemosensors) with high sensing capability for sensing different kinds of volatile organic compounds (VOCs). However, there is no study on molecular design of metal complexes toward high sensing capability. Therefore, by using 4-(3,5-dimethoxybenzyl)-3,5-dimethyl pyrazole ligand¹⁾ (**1e**) and group 11 metal ions (Cu(I), Ag(I), Au(I)), we report the systematic study on vapochromic sensing of VOCs such as alcohol derivatives using phosphorescent trinuclear pyrazolate complexes with supramolecular assembly of a weak intermolecular metal-metal interactions. Previously, the resulting trinuclear copper(I) 4-(3,5-dimethoxybenzyl)-3,5-dimethyl pyrazolate complex **2e(Cu)** revealed positive response to ethanol vapors by blue-shifting its emission band from 616 to 555 nm and emitting bright orange to green where the original intensity can be easily recovered and then reused without external stimuli.²⁾ Moreover, **2e(Cu)** still showed the best performance for chemosensor of ethanol vapors compared to the same complexes synthesized from different side-chains at the pyrazole rings such as non-side chain, 3,5-dimethyl, 3,5-bis(trifluoromethyl), and 3,5-diphenyl pyrazole ligands.³⁾ In this lecture, we particularly discuss the sensing capability of group 11 metal ions with the same ligand **1e**. Upon excitation at 284, the resulting complexes showed emission bands with a peak centered at 616, 473 and 612 nm for **2e(Cu)**, **2e(Ag)** and **2e(Au)**, respectively. Comparing to **2e(Cu)** with shorter metal-metal distance for sensing ethanol vapors in 5 mins, **2e(Au)** gave shifting from its emission band centered at 612 to 587 nm with $\Delta\lambda$ of 25 nm and color changes from red-orange to light green-orange. This blue-shifting was 41% compared to **2e(Cu)** with the same exposure time while the reusability testing required the presence of external stimuli. On the other hands, **2e(Ag)** with longer metal-metal distance showed quenching in its original emission intensity at 473 nm in 40% with color changes from dark green to less emissive. These results demonstrate that shifting phenomenon in **2e(Cu)** with the shorter metal-metal distance compared to **2e(Au)** from the same ligand is due to a weak intermolecular hydrogen bonding interaction of O atom at the methoxy of the benzyl ring with the OH of the vapors at the outside of the molecules. Such sensing phenomenon cannot be achieved for the detection of propanol, butanol, pentanol and hexanol vapors with decreasing in the performance to 37%, 28%, 23% and 18%, respectively, indicating suitable molecular design of ligand and metal ion in pyrazolate complex as chemosensor **2e(Cu)** for sensing ethanol vapors.

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JCC2017216

Ab Initio Computational Study of –N-C and –O-C Bonding Formation :Functional Group Modification Reaction Based Chitosan

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Chitosan widely used as a drug delivery, antibacterial, adsorbent, and in cosmetic.¹⁾ However, the chitosan has a low solubility in alkaline and neutral pH solutions, so that its application is limited.^{1,2)} Modification of -NH₂ and -OH functional groups of chitosan by monochloroacetic acid (MCAA) to form the more hydrophilic functional groups of -NHCH₂COOH and -OCH₂COOH through the -N-C and -O-C bonding, respectively, can increase the chitosan solubility and its application. The more hydrophilic functional group of -CH₂COOH than -H on -NH₂ and -OH of chitosan increase hydrophilicity properties of chitosan so that increasing its solubility.

In this research has been studied the reaction mechanism between chitosan and MCAA reactants into CMC (carboxymethylchitosan), computationally.^{3,4)} The aim of this research is to determine the prefer formation of -N-C and -O-C bonding. Dimer form of chitosan used as a molecular model in calculation. All the molecular structure involved in the reaction mechanism (R : reactant, TS-n : transition state, I-n : intermediate, and P : product, Fig. 1) was optimized by ab initio computational on the theory and basis set HF/6-31G(d,p).

The hypothetical of the reaction mechanism was performed on six mechanism models namely two via S_N1 (monomolecular nucleophilic substitution) produced O-CMC-1 and N-CMC-1, and four via S_N2 (bimolecular nucleophilic substitution) produced O-CMC-2, N-CMC-2, N,O-CMC-1 and N,O-CMC-2. The results showed that the -N-C bonding formation via S_N2 prefer than the -O-C bonding formation via S_N1 which have activation energy 469.44 kJ.mol⁻¹ and 770.08 kJ.mol⁻¹ respectively.

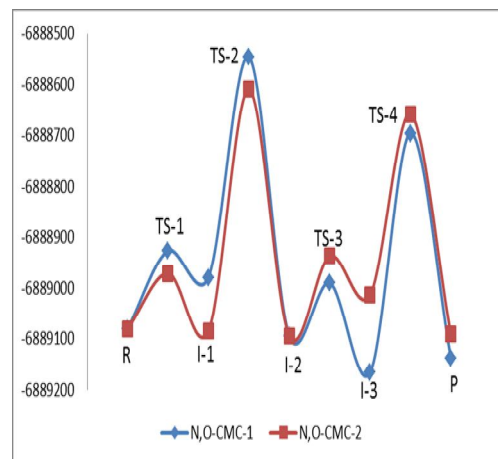


Fig. 1 Potensial Energy Surface of reaction mechanism of formation of N,O-CMC-1 and N,O-CMC-2

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JCC2017222

Development of Performance Assessment Instrument Based on Contextual Learning to Measure Students Laboratory Skill

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The aim of this research is to analyse the implementation of applied chemical product (coconuts oil, chitin-chitosan, coagulan and flocculan) based on *Science, Environment, Technology, and Society* (SETS) in chemistry concept understanding at senior high school students. The research method was designed by giving *Big Task* of applied chemical products in chemistry learning processes with Project Base Learning (PBL) approaches in experiment class. Meanwhile, the PBL approaches were also applied by giving different problems at the same subject matter in control class. After treatment, the two classes were tested with understanding detection diagnostic test at the same concepts. After analysing the data, the result shows that student concept understanding was increased significantly at the experiment class. Further, the student activities were raised up, student motivation to study chemistry was increased, and the classical achievement was obtained by giving the project. Learning processes become more useful and provide the experience improvement to the students in facing the application of the 2013 curriculum.



JCC2017224

FTIR and FT-Raman analysis of Bentonite Modified with 3-aminopropyltrimethoxysilane

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The modification of Bentonite was performed using 3-aminopropyltrimethoxysilane in different dispersion medium. The modified products (BNT-APS) were characterized by Fourier transform infrared (FTIR) and raman spectroscopy. FTIR data showed that a high intensity peak at 900 - 1250 cm⁻¹ due to Si - O stretching on Si - O - Si group on bentonite. For all BNT-APS, new peaks appear on the 1400-1600 cm⁻¹ region due to the banding vibrations of NH₃ and CH₂ groups. The presence of monmorillonite as main structure of bentonite was confirmed by characteristic peak at 290 cm⁻¹ and 709 cm⁻¹ in FT-Raman spectroscopy.



JCC2017226

Chemical and Physical Composition and Mosquito Repellent Activity of Fractionation Active Component from Java Citronella Oil (*Cymbopogon winterianus*)

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Dengue fever (DHF) is one of the world's health problems. The number of people which suffered increased 50-fold in the last five decades. Therefore, it is urgent to develop a mosquito repellent has to control the mosquito vectors are safe for the environment and do not have any toxic effects on humans. Mosquito repellent made from Java Citronella Oil (*Cymbopogon winterianus*) is an alternative potential to be developed into a green mosquito repellent. Based on GC-MS analysis of Java Citronella Oil is known that citronellal, citronellol, and geraniol has yielded 21,59%; 7,43%; and 34,27%, respectively.

Fractional distillation under reduced pressure and continued redistilled are needed to isolate active component. Redistilled can improve the purity, then distillate collected while the temperature changed. In the first distillate yielded citronellal with a purity of 95.10%. The first distillate obtained residue rhodinol product will then be carried back to separation into citronellol and geraniol. The purity of citronellol reached 80,65% purity, whereas geraniol reached 76.63% purity. The p-menthane-3,8 diol obtained from refining citronellal resulting citronellal and p-menthane-3,8 diol reached to 75.95% purity.

The repellent activity of each product was measured by the protection period against the bites of *Aedes aegypti* during one hour. The result showed that the most active product is p-menthane-3,8 diol with repellency percentage achieved 89,34%. This activity was found in order to : p-menthane-3,8 diol > rhodinol > geraniol > citronellol > citronellal.



JCC2017228

Removal of cadmium from wastewater by adsorption with the modified iron-mesoporous silica SBA-15

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In this study, the characterizations and adsorption efficiencies for cadmium was evaluated using the modified iron-mesoporous silica which is manufacture-grade Fe₂O₃-mesoporous silica SBA-15. XRD, EDAX and FTIR analyses were performed to determine the characteristics of the material. The adsorption cadmium on the Fe₂O₃-mesoporous silica SBA-15 prepared in this work from initial concentration 23,97 mol/L for 7 h at 50 °C with mixture process at 250 rpm. Pore sizes of Fe₂O₃-mesoporous silica SBA-15 (8,2 nm) and iron contents (3.62%) were found on the surface of the Fe₂O₃/mesoporous silica SBA-15. The functional group of assymetric Si-O-Si and Fe-O-Si found at 1085 cm⁻¹ and 678 cm⁻¹ respectively. Fe₂O₃-mesoporous silica SBA-15 was found to have excellent adsorption efficiency cationic cadmium as heavy metals. The adsorption capacities for cadmium were 29,7 mol/g, which were obtained using a equilibrium time after 2 h. In experiments, the dosages of the Fe₂O₃ source was 5% were observed in the removal efficiency. Based on these results, the modified iron-mesoporous silica (Fe₂O₃/SBA-15) was observed to be a promising material for treatment of plating wastewater.



JCC2017237

Molecular Docking Simulation of Neuraminidase Influenza a Subtype H1N1 with Potential Inhibitor of Disulfide Cyclic Peptide (DNY, NNY, LRL)

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Oseltamivir resistance as an inhibitor of neuraminidase influenza A virus subtype H1N1 has been reported lately. Therefore, to solve this problem, several kinds of research has been conducted to design and discover disulfide cyclic peptide ligands through molecular docking method, to find the potential inhibitors for neuraminidase H1N1 which then can disturb the virus replication. This research was studied and evaluated the interaction of ligands toward enzyme using molecular docking simulation, which was performed on three disulfide cyclic peptide inhibitors (DNY, LRL, and NNT), along with oseltamivir and zanamivir as the standard ligands using MOE 2008.10 software. The docking simulation shows that all disulfide cyclic peptide ligands have lower Gibbs free binding energies ($\Delta G_{\text{binding}}$) than the standard ligands, with DNY ligand has the lowest $\Delta G_{\text{binding}}$ at -7.8544 kcal/mol. Furthermore, these ligands were also had better molecular interactions with neuraminidase than the standards, owing by the hydrogen bonds that were formed during the docking simulation. In the end, we concluded that DNY, LRL and NNT ligands have the potential to be developed as the inhibitor of neuraminidase H1N1.

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JCC2017240

Analysis of Hydrogen Gas Production from Seawater Electrolysis Using Variation of Voltage

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A study was conducted on hydrogen gas production by electrolysis method using seawater with voltage variation. Seawater electrolysis is the decomposition of water compound (H_2O) into hydrogen gas (H_2) and chlorine (Cl_2) using electric current. The electrolysis was done using 3 volts, 6 volts, and 12 volts voltage variation. The amount of mass and volume of H_2 obtained on the electrolysis of seawater with voltage of 3 volts, 6 volts, and 12 volts is 200.408×10^{-6} g and 2468.026×10^{-6} L (3 volts), is 887.131×10^{-6} g and 10925.019×10^{-6} L (6 volts), 1342.433×10^{-6} g and 16532.064×10^{-6} L (12 volts). Seawater is a strong electrolyte so that the process of electrolysis of seawater is fast. The greater the used voltage the greater the mass and volume of hydrogen gas produced.

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JCC2017244

Aluminium - Cobalt-Pillared for Dye Filtration Membrane

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The manufacture of membrane support from aluminium cobalt pillared clay has been conducted. This research was conducted by mixing a clay suspension with pillared solution prepared from the mixture of $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ and $\text{AlCl}_3 \cdot 6\text{H}_2\text{O}$. The molar ratio between Al and Co was 75:25 and the ratio of $[\text{OH}]/[\text{metal}]$ was 2. The clay suspension was stirred for 24 hours at room temperature, filtered and dried. The dried clay was then calcined at 200°C, 300°C and 400°C with a ramp rate of 2°C/min. Aluminium-cobalt-pillared clay was then characterized by XRD and GSA and moulded become a membrane support for subsequent tests on dye filtration.

The XRD analysis showed that basal spacing (d_{001}) value of Aluminium cobalt was 19.49 Å which was higher than natural clay of 15.08 Å, however the basal spacing decreased with increasing calcination temperature. The result of GSA analysis showed that the pore diameter of the aluminium cobalt pillared clay membrane was almost the same as that of natural clay that were 34.5 Å and 34.2 Å respectively. Nevertheless, the pillared clay has a more uniform pore size distribution. The results of methylene blue filtration measurements demonstrated that the membrane support could filter well which shown by a clear filtrate at all tested concentrations. The value of rejection and flux decreased with the increasing concentration of methylene blue. The values of dye rejection and water flux reached 99.89% and $5.80 \times 10^{-6} \text{ kg min}^{-1}$ respectively but they decreased with increasing methylene blue concentration. The results of this study indicates that aluminium-cobalt pillared clay could be used as membrane materials especially for ultrafiltration.

JCC2017247

Fractionation of Glucomannan, New Hope for Corneal Lamellar Laceration Therapy, “A Preliminary Study”

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The corneal lamellar laceration is an emergency case in ophthalmology that damage of half thickness of the cornea. The function of glucomannan in wound healing is activated macrophage, increase function of fibroblast and increased synthesized of collagen. The objective of this study is to compare corneal histopathologic description in rats with and without Fractionation of glucomannan therapy in corneal lamellar laceration wound. This study was an experimental study using rats model to produce corneal lamellar laceration wound. Twenty BALB/c rats were randomly divided into four groups. The first and third group was given artificial tears eye drops and ofloxacin eye drop. The second and fourth group was given fractionation of glucomannan and ofloxacin eye drop. Eyes in the first and second group were enucleated after one day therapy, eyes in the third and fourth group were enucleated after three days therapy. Histopathologic specimens were made to assess polymorphonuclear (PMN) cells amount, epithelial proliferation, and keratocytes cells amount. From this study, PMN cells amount in group I is moderate (46.7%) and group II is low (60%). Epithelial proliferation in group I is degree of I (46.7%) and group II is degree of III (66.7%). Mean keratocytes cells amount in group I is 26.67 ± 10.99 and group II is 32.73 ± 12.46 . All aspect were compared and statistical significant ($p= 0.001$, $p=0.031$) except in mean keratocytes cells not statistical significant ($p=0.22$). PMN cells amount in group III is moderate (53.3%) and group IV is low (73.3%). Epithelial proliferation in group III is migration of cells degree of I (53.3%) and group IV is degree of III (73.3%). Mean keratocytes cells amount in group III is 16.60 ± 2.75 and group IV is 34.06 ± 13.66 . All aspect were compared and statistical significant ($p= 0.02$, $p=0.031$ dan $p=0.00$). PMN cells amount in fractionation of glucomannan therapy were fewer compared to non fractionation of glucomannan therapy. Epithelial proliferation in fractionation of glucomannan therapy were faster compared to non fractionation of glucomannan therapy. Keratocytes cells amount in fractionation of glucomannan therapy was same with non fractionation of glucomannan therapy after one day therapy but more plenty after three days therapy.

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JCC2017248

Characterization of ZnO Nanoparticles from Waste Galvanized by Using Acetic Acid Extraction Followed by Precipitation

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Galvanized waste processing generally uses pyrometallurgy process. Pyrometallurgy process has the disadvantage that requires very high energy in synthesizing zinc oxide. Pyrometallurgy process use high temperatures from 1400 to 1600 °C. In this paper, we discuss characterization synthesis ZnO nanoparticle with use hydrometallurgy process. Hydrometallurgy process is one alternative solution that is easy and economical. Hydrometallurgy process including leaching process, precipitation, washing and calcination. This paper is divided into four phases including : Process selectivity leaching using a weak acid (CH_3COOH) 50%, Process precipitation using a precursor carbonate (Na_2CO_3) 3 M until pH 8, filtration processes and washing process by using distilled water and methanol, and then do Process calcination at T 800 °C for 2 hours. Each stage characterized by using TG-DTA, XRD analysis, SEM-EDX and FTIR. Results product of this paper are ZnO nanoparticles and CH_3COONa (sodium acetate).

JCC2017254

Assessment of Drug Binding Potential of Pockets in the NS2B/NS3 Dengue Virus Protein

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Every year an endemic dengue fever estimated to affect over 390 million cases in over 128 countries occurs. However, the antigen types which stimulate the human immune response are variable, as a result neither licenced vaccines nor antiviral treatments have been successfully developed for this disease. The NS2B/NS3 protease of the dengue virus (DENV) responsible for viral replication is a potential drug target. The ligand-enzyme binding site determination is a key role of the success of virtual screening of new inhibitors. The NS2B/NS3 protease of DENV (PDB ID: 2FOM) has two pockets consisting of 37 (Pocket 1) and 27 (Pocket 2) amino acid residues in each pocket. In this research, we characterised the amino acid residues for binding sites in NS3/NS2B based on the hydrophobicity, the percentage of charged residues, volume, depth, $\Delta G_{\text{binding}}$, hydrogen bonding and bond length. The hydrophobic percentages of both pockets are high, 59 % (Pocket 1) and 41% (Pocket 2) and the percentage of charged residues in Pocket 1 and 2 are 22% and 48%, and the pocket volume is less than 700 Å³. An interaction analysis using molecular docking showed that interaction between the ligand complex and protein in Pocket 1 is more negative than Pocket 2. As a result, Pocket 1 is the better potential target for a ligand to inhibit the action of NS2B/NS3 DENV.

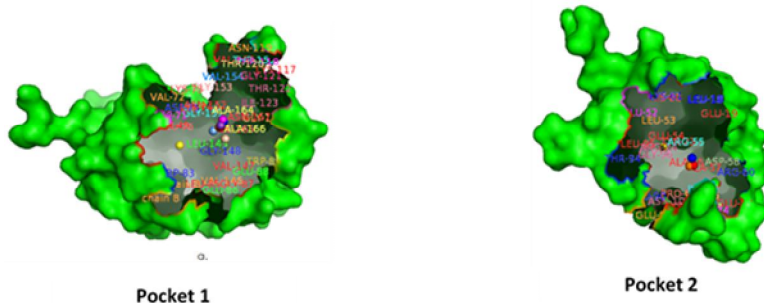


Fig.1. Potential Binding Pockets of NS2B/NS3 Dengue Virus Protein

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JCC2017255

Potentials of n-Heksan, Aseton and Ethanol Fraction Extract in Palmyra Fruit (*Borassus flabellifer* L.) as Antioxidant

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Potential of n-Hexane, Acetone and Ethanol Extract Fractionation in Palmyra fruit (*Borassus flabellifer* L.) as antioxidant have general aims to testing the antioxidant activity of the extract fractionation *Borassus flabellifer* L. using diphenylpicrylhydrazyl (DPPH). Especially, this study aims to determine the value of IC 50 antioxidant activity contained in extract fractionation *Borassus flabellifer* L. using DPPH method. Related contributions from research conducted is then expected to use as source of information and reference to the use of the plant as a good antioxidant and also in medicine. In this study, *Borassus flabellifer* L. is made in the form of extracts fractionation using some solvent n-hexane, acetone, and ethanol and maceration to obtain the purified extract using DPPH. In the research the first stage of sample preparation, maceration and extraction of n-Hexane, Acetone and Ethanol Fractionation of *Borassus flabellifer* L. test the antioxidant activity using DPPH method. Determination of antioxidants to make DPPH solution first, then made a stock solution of each extract n-hexane, acetone, and ethanol is purified *Borassus flabellifer* L. by dividing the five concentrations in a matter of dilution, having obtained the maximum results. In this research it is expected that the plant can be used as an antioxidant.

Keywords: Palmyra fruit, *Borassus flabellifer* L, antioxidant, DPPH



JCC2017258

Synthesis of Eugenol–Lauryl Methacrylate Copolymers via Cationic Polymerization

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Eugenol was been one of the most abundant natural resource in Indonesia. Recently biobased polymer resin were created based on eugenol because eugenol was functionalized with polymerizable group. In order to improve the functional properties of eugenol, in this research Eugenol–LMA copolymers (copoly(Eg-LMA)) were synthesized by cationic polymerization using H_2SO_4 as an initiator under nitrogen atmosphere. Structure identification of the copolymer shows the absorption of the vinyl group from the monomers dissapear at the analysis through FTIR at the wave number 1637-1639 and 985-995 cm^{-1} and also $^1\text{H-NMR}$ on the chemical shift 5,97 and 5,08 ppm. The resulting copolymers were obtained brown powder in 32,03 % yields. Solubility test of the copoly(Eg-LMA) show that the polymer can not soluble in water but soluble in chloroform, diethyl ether and benzene. Average molecular weight of copoly(Eg-LMA) also investigated using ostwald viscometry obtained average molecular weight of copoly(Eg-LMA) of 42020 with degree of polymerization by 200.



JCC2017262

Modification of montmorillonite with tetraethyl ortosilicate (TEOS) and cetyl trimethylammonium bromide (CTAB)

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The modification of montmorillonite (MMt) with TEOS and CTAB has been done. The aim of the research is to study the effect of CTAB onto MMt previously adsorbed with TEOS. This research is a preliminary step to invent host material which could be intercalate with other smart materials in the inter layer.

The research has been done by vary the CTAB from 0.25; 0.5; 2.0; 3.5; to 5.0 (mmol/gr) toward MMT previously adsorbed with 8 mL TEOS 0.04 M in ethanol. The materials characterized with X-ray Diffraction (XRD) to analysis its basal spacing and its composition, Fourier Transform Infra-Red (FTIR) to analysis its functional groups, and Scanning Electron Microscope SEM - Energy Dispersive X-ray (SEM-EDX) to analysis its morphology and elemental composition. Cation exchange capacity (CEC) analysis with titration methode.

The results show that MMt succesfully modified. MMT identified with diffraction peak (2θ) of 6.31; 12.35; 18.61; 24.93; 31.40, 37.81, 44.28, 51.19, and 58.29 ($^{\circ}$) initially has basal spacing of 16 Å increase to 28.45 Å (77.64%). The exsistance of CTAB and TEOS in the layer of MMT indicated by the peak of 2853 and 2926 (cm^{-1}) from the vibration of CH group and wave number of 525.62; 794.71; 922.01; and 1060.89 (cm^{-1}) from the vibration of siloxane. TEOS hydrolized and polymerized in the basal spacing of MMt. However, Na^{+} of MMt replaced by N^{+} molekul of CTAB. The CEC of modified MMt is 0,031 mmol/gr.

Keywords: montmorillonite; CTAB; modification



JCC2017263

Chemical Characteristics And Fatty Acid Profile Of Butterfly Tree Seed Oil (*Bauhinia Purpurea* L)

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Butterfly tree (Kachnar) in Indonesia is only used as ornamental plant in garden, park and roadsides. The seed of Butterfly tree was extracted with n-hexan and physicochemical properties were determined based on Standard Nasional Indonesia (SNI) 01-3555-1998 while the oil chemical composition was determined using GC-MS. The result showed that rendement of the oil as 57.33 ± 1.14 % (w/w) and the chemical characteristic of seed oil include acid value (13.78 ± 0.23 mg KOH/g) saponification value (153.32 ± 1.85 mg KOH/g), peroxide value (43.51 ± 0.57 mg KOH/g) . The butterfly tree seed oil showed that linoleic acid (28.11 %), palmitic acid (29.2%), oleic acid (19.82%) and stearic acid (10.74 %) were the main fatty acids in the crude seed oils. Minor amounts of neophytadiena and arachidic acid were also identified.

Keywords : kachnar seed oil, butterfly seed oil, *Bauhinia purpurea* L, plant oil



JCC2017267

Effect of Temperature to Adsorption Capacity and Coefficient Distribution on Rare Earth Elements Adsorption (Y, Gd, Dy) Using SIR

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The use of REE like element of Yttrium (Y) as a superconducting material requires a purity of more than 90% so it needs to increase the purity of Y from the settling process¹. The purpose of this research is to study the separation process of REE that are Y, Gd, Dy elements from REE hydroxide ($\text{REE}(\text{OH})_3$) using SIR method are consisting of Amberlite XAD-16 resin impregnated with Di-(2-ethylhexyl) phosphate (D2EHPA) and Tributyl Phosphate (TBP) and determine the isotherm model on REE adsorption and determine the kinetic model of pseudo adsorption reaction¹. This research was started by activating XAD -16 resin and is mixed with TBP-D2EHPA solvents so it will form SIR², then it is conducted on variation of SIR composition, temperature variation of adsorption process, determination of equilibrium equation and kinetic sorption occurring in SIR adsorption based on experiment data of liquid concentration as function of time. Based on the calculation result, the most effective SIR composition for REE separation is 0.75 g, the equilibrium equation for Y, Gd and Dy follows the Henry equilibrium model and the pseudo kinetic model of the reaction order Y, Gd, and Dy is followed by the pseudo reaction of order 2. The result of separation of LTJ with SIR is said to be effective from other method because purity is obtained that is 96.73% and qualify as a super conductor material.

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JCC2017270

The Wastewater Treatment Processes and Mechanism of Organic Matter Removal by Modified Multi-Soil-Layering System

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The treatment of organic wasted water by a modified Multi-Soil-Layering system (M-MSL) were investigated by using a laboratory scale system, which was set up in a D19×W49×H66 cm acrylic box enclosing “soil mixture blocks” alternating with permeable zeolite layers. The M-MSL systems consisted of 4 layers of soil mixture layers, 1 layer sand, and 1 layer coconut husk were constructed. This research was conducted by varying the loading rate of organic wastewater into the system of 160, 320, 480, and 800 L.m⁻².day⁻¹. The parameters tested in this study include pH, total suspended solid (TSS), biological oxygen demand (BOD), and chemical oxygen demand (COD) before and after processing. For the study of the treatment processes inside the system, wastewater, with mean concentrations (mg/L) of BOD: 1905, COD: 2450, and TSS 775 were introduced into the system with the optimum loading was 320 L.m⁻².day⁻¹. The results of this study revealed that the removal of TSS, BOD, and COD were 75-88, 90-97, and 75-87%, respectively. The study demonstrated that M-MSL systems have the potential to remove high percentages of TSS, BOD, COD and ammonia.



JCC2017271

Quantitative Analysis of Curcuminoid Collected from Different Location in Indonesia by TLC-Densitometry and Its Antioxidant Capacity

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Curcuminoid, consisting of curcumin, demethoxycurcumin and bis demethoxycurcumin, is the active compound in *Curcuma longa* L. rhizome. It yielded vary depend on the environment and varieties. Curcumin has been known to have a potent antioxidants activity. The present work was conducted to assess the curcuminoid content and antioxidant capacity in the crude extracts of *C. longa* L. collected from eight different locations in Indonesia.

Samples were collected from eight locations including Java island, Sumatera island and Nusa Tenggara island. All samples were extracted using 96% ethanol and analyzed quantitatively using TLC-Densitometry. Antioxidant activity was assessed using diphenylpicrylhydrazyl (DPPH) radical scavenging assay and analyzed at 517 nm using a spectrophotometer.

Curcuminoid content in *C. longa* varied among eight different locations (0.53 ± 0.05 - 5.33 ± 0.12 % w/w). The highest curcumin, demethoxycurcumin and bisdemethoxycurcumin yield were found in the samples from Magetan ($5.33 \pm 0.12\%$, $1.54 \pm 0.05\%$, $0.46 \pm 0.02\%$ w/w, respectively). In contrast, the lowest curcumin, demethoxycurcumin and bisdemethoxycurcumin yield were found in the sample from Demak ($0.53 \pm 0.05\%$, $0.17 \pm 0.05\%$, $0.17 \pm 0.05\%$ w/w, respectively). Antioxidant capacity showed similar for all places unless sample from Magetan which exhibited two times lower than other locations. It is apparently curcuminoid content and antioxidant activity varied among places. These results are useful information for curcuminoid standardization method in pharmaceutical products.



JCC2017274

Photocatalyst of Perovskite CaTiO_3 Nanopowder Synthesized from CaO derived from Snail Shell and Comparison with CaO and CaCO_3

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Calcium titanate belongs to the important group of compounds with a perovskite structure having high dielectric loss for various applications including photocatalysis mechanism. Refer to the principles of green chemistry, in this work preparation of CaTiO_3 was conducted by using CaO derived from snail shell. Aim of this research are to study the physicochemical character of perovskite derived from snail shell and its comparison with CaO and CaCO_3 as Ca sources. Material preparation was performed by solid reaction of Ca sources with TiO_2 under comparison with CaO and CaCO_3 precursors. Mixture of Ca sources with TiO_2 in certain proportion were ground and calcined at the temperature of 200 °C for 2 hs. Materials were characterized by using X-ray diffractometer (XRD), Fourier Transform Infra Red (FTIR) and the photocatalytic activity was tested by using methylene blue photooxidation. Perovskite synthesized using CaO derived from snail shell exhibits the similar XRD pattern with that were prepared by using CaO and CaCO_3 . From the photooxidation activity test, it is proven that CaTiO_3 shows similar photocatalytic activity correspond to that were prepared by CaO and CaCO_3 . Utilization of shell as agricultural waste of the synthesis of CaTiO_3 perovskite is the novelty of this work. Furthermore, the study on material structure and photoactivity is the main focus for the application in industry and environment.

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JCC2017275

Surface and Groundwater Interactions: Cikapundung Bandung, Kanal Banjir Timur Semarang and Cisadane Tangerang

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Hydrology in Indonesia has been studied since the Dutch era. But for the study of hydrogeology just started in the early 1990s. Research on hydrogeology also continues to grow, beginning with a regional study on the groundwater basin, to detailed studies of groundwater pumping, soil degradation, and the relationship between the two, as well as groundwater quality. Some Research states that the multi-aquifer order is found beneath the surface of some place in Indonesia. This system is very much found in alluvial coastal areas. Therefore, it is often found that the interaction between surface water and groundwater is not depressed (or so-called shallow groundwater). The same interaction also occurs in Cikapundung Bandung, Kanal Banjir Timur Semarang and Cisadane Tangerang. Based on the sample test using water parameters found interaction between groundwater quality and river water.

JCC2017276

Effect of Ratio of Sugar Palm Fruit (*Arenga pinnata*) and Carrageenan and Citric Acid on Moisture Content, Biodegradability, and Functional Groups of Biodegradable Film

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Biodegradable film is a type of plastic material that can be degraded naturally as it is made of organic material. The material commonly used in filmmaking is polysaccharides. The materials that can be used are sugar palm fruit and carrageenan. In addition, other materials are also used, i.e. glycerol as a plasticizer, and citric acid as cross linker. The objective of this research is to study the effect of ratio of sugar palm fruit and carrageenan and the addition of citric acid on the moisture content, biodegradability, and functional groups of biodegradable film.

Moisture content analysis was conducted to determine the water absorption by film. The films were cut rectangles measuring 1x3 cm. The moisture content was determined using oven drying method. The biodegradability of the film was determined using Burial Test method, where the pre-weighted film samples were buried in soil. The weight of the samples was taken at regular time (every day) to check for weight loss. Furthermore, FTIR (Fourier Transform Infra-Red) analysis was conducted to determine the molecular structure of the film.

The result shows that the moisture content of the film decreases as the percentage of citric acid increases. The biodegradability of the film increases with the increase of ratio of sugar palm fruit and carrageenan. The FTIR test result shows that the addition of citric acid results in ester group as the result of reaction of carboxyl group of citric acid and hydroxyl group of polysaccharides.



Fig. 1 Biodegradable film result

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JCC2017277

The role of pectin in Pb binding by carrot peel biosorbents : Isoterm adsorption Study

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Cheaply and abundantly biosorption available materials such as carrot peels can be a cost efficient method for removing heavy metals from wastewater. To investigate the role pectin plays in metal binding by carrot peels, commerce pectin was compared. FTIR spectra confirmed the presence of carboxyl and hydroxyl groups in commerce pectin and carrot pectin. Isoterm experiments showed that all materials can remove Pb(II) ion. All of materials binding Pb(II) follow Freundlich models adsorption. The commerce pectin bind Pb(II) by involving energy 16.6 KJ/mole whereas pectin from carrot peel involve energy 21.09 KJ/mole. It indicate that commerce pectin bind the Pb(II) by physics adsorption whereas pectin from carrot peel by physics and chemical adsorption.



JCC2017278

Curcuminoid content of *Curcuma longa* L. and *Curcuma xanthorrhiza* rhizomebased on drying method with NMR and HPLC-UV

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Curcuminoid, consisting of curcumin, demethoxycurcumin and bis demethoxycurcumin, is the major compound in *Curcuma longa* L. and *Curcuma xanthorrhiza* rhizome. It has been known to have a potent antioxidant, anticancer, antibacterial activity. Those rhizomes need to be dried beforehand which influenced the active compounds concentration. The present work was conducted to assess the curcuminoid content of *C. longa* and *C. xanthorrhiza* based on drying method with Nuclear Magnetic Resonance (NMR) and High Pressure Liquid Chromatography (HPLC)-UV. Samples were collected and dried using freeze-drying and oven method. The latter is the common method applied in most drying method at herbal medicine preparation procedure. All samples were extracted using 96% ethanol and analyzed using NMR and HPLC-UV. The former will be further analyzed with orthogonal Principle Least Square-Discriminant Analysis (OPLS-DA) to determine the metabolite related to drying method. Metabolite profile content in *C. longa* and *C. xanthorrhiza* differed between freeze-drying and oven method based on OPLS-DA. Curcuminoid is one of the metabolite related to separation due to drying method. HPLC-UV as a reliable analytical method for the quantification is subsequently used to confirm the data obtained by NMR. These results are useful information for simplifying standardization method in pharmaceutical products regarding preparation procedure.



JCC2017283

Effect of Preparation Methods on the Activity of Titanium Dioxide-Carbon Nitride Composites for Photocatalytic Degradation of Salicylic Acid

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Titanium dioxide has been recognized as an active photocatalyst especially for water treatment technology.¹⁾ Unfortunately, the anatase titanium dioxide can only be activated by ultraviolet (UV) light while the rutile form can only extend its absorption near visible light irradiation due to its large band gap energy, which are 3.20 and 3.03 eV, respectively.²⁾ Since solar spectrum consists of more visible part than UV light, designing visible light active photocatalyst is crucial. Carbon nitride has been one of the potential visible light active photocatalysts that can be prepared by a cheap precursor such as urea.³⁾ In this study, titanium dioxide-carbon nitride composites were prepared by three methods, which were one pot oxidation, impregnation, and physical mixing. Investigating the effect of these preparation methods is an important approach to develop highly active photocatalysts.

Each series of the photocatalysts were prepared with different ratios of titanium to carbon, *i.e.*, 1, 5, 10, 20, and 50 mol%. All samples were characterized by X-ray diffraction (XRD) and diffuse reflectance ultraviolet-visible (DRUV-Vis) spectroscopies. The characterization results confirmed the successful preparation of titanium dioxide, carbon nitride, and the titanium dioxide-carbon nitride composites. Photocatalytic activity tests were carried out for degradation of salicylic acid at room temperature under UV and visible light irradiations. It was confirmed that all the prepared titanium dioxide-carbon nitride composites showed better photocatalytic activities than the bare titanium dioxide and bare carbon nitride. Under UV light irradiation, 90.6% of salicylic acid degradation was achieved on the best composite prepared by one pot oxidation with 5 mol% of titanium to carbon (Ti/C) ratio. On the other hand, the highest degradation under visible light irradiation was 94.30%, observed on the composite that was prepared also by one pot oxidation method with the Ti/C ratio of 10%. Therefore, among the investigated methods, the best method to prepare the titanium dioxide-carbon nitride composites with high photocatalytic activity was one pot oxidation method. Owing to the higher conduction band of titanium dioxide than the carbon nitride, the excited electrons would be transferred from the conduction band of titanium dioxide to the conduction band of carbon nitride. This would reduce the electron recombination rate in the titanium dioxide, which would result in the synergic effect to enhance the activity of the composites. Under UV light irradiation, in addition to the generated holes on titanium dioxide, generated holes on carbon nitride would also react with salicylic acid to finally produce water and carbon dioxide. On the other hand, under visible light irradiation, the generated holes on the carbon nitride would be the main active species that would oxidize the salicylic acid.



JCC2017293

Separation of Gadolinium (Gd) Using Sinergis Solven Mixed Topo-D2ehpa With Extraction Method

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The main problem to obtain Gd with high purity is the similarity of chemical properties and physical properties with the other REE such as Y and Dy, it is necessary to do separation by the extraction process¹⁾. The purpose of this research to determine the best solvent type, amount of solvent, feed and solvent ratio in the Gd extraction process, to determine the rate order and the value of the rate constant of Gd concentration based on experimental data of aqueous phase concentration as a function of time²⁾ and to know the effect of temperature on the reaction speed constant. This research was conducted on variation of solvent, amount of solvent, feed and solvent ratio in the extraction process of Gd separation, extraction time to determine the order value and the rate constant of Gd concentration in extraction process based on the aqueous phase concentration data as a function of time, To the rate constant of decreasing concentration of Gd. Based on the calculation results, the solvent composition was obtained with the best feed to separate the rare earth elements Gd in the extraction process is 1 : 4 with 15% concentration of TOPO and 10% concentration of D2EHPA. The separation process of Gd using extraction method by solvent TOPO-D2EHPA 2 : 1 comparison is better than single solvent D2EHPA / TOPO because of the synergistic effect. The rate order of separation process of Gd follows order 1. The Arrhenius Gd equation becomes $k = 1.46 \times 10^{-7} \exp (-6.96 \text{ kcal / mol / RT})$.

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JCC2017298

Carp Operculum Bone (Cyprinus Carpio Sp.) Scaffold is A Potential Xenograft Implant Material: A Histological Study

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Implants used for orbital floor fracture are divided into autograft, allograft and xenograft implant. The result from a preliminary study of carp operculum bone as a xenograft implant reveal that this material has an element of protein/amino acid collagen compound and hydroxyapatite formed the matrix. The scanning electron microscope analysis showed that the matrix was consisted of porous sheet-shaped orb that interconnect with each other and serve as a good scaffold for bone healing process. Despite these findings, histological study is still required to observe tissue response of foreign-body giant cells between the host and donor as well as the osteoconduction process. This study aimed to observe the number of new osteoblast cells and foreign-body giant cells after implantation of carp operculum bone xenograft implant in bone fracture animal model. Carp operculum bone and bovine ribs were implanted on calvarian bone of white male rats (*rattus novergicus*). After 15 days, the calvarian bone was harvested and histologic preparations were made. The number of foreign-body giant cells and osteoblast cells were counted using light microscope. The result of this study was foreign-body giant cells were seen in the two groups of xenograft implant on bone fracture animal model. Osteoblast cells were also found in the implant area. In conclusion, histological study of carp operculum bone xenograft implant showed osteoconductive ability and similar healing process as the standard bovine ribs xenograft implant.



JCC2017300

Photodegradation of Methyl Violet Using Graphite/PbTiO₃ Composite

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Photocatalytic degradation of Methyl Violet dye using Graphite/PbTiO₃ composites has been conducted. The purposes of this research were to synthesis the Graphite/PbTiO₃ composite and determine its effectiveness on Methyl Violet degradation. Synthesis of Graphite/PbTiO₃ composite was successfully performed via sol-gel method by mixing graphite powder, titanium tetra isopropoxide precursor solution (TTIP) and Pb(NO₃)₂. The Graphite/PbTiO₃ composites were characterized using X-Ray Diffraction (XRD), Fourier Transform-Infra Red (FT-IR) and Scanning Electron Microscopy (SEM). The XRD diffractogram and IR spectrum of Graphite/PbTiO₃ composite revealed all characteristic peak of graphite and PbTiO₃. Photocatalytic degradation process showed that Graphite/PbTiO₃ composite decreased concentrations of Methyl Violet up to 92.20%. The longer the degradation of methyl violet becomes greater, and degradation occurred significantly within 5 minutes.



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Synthesis and Characterization of Bismuth Oxide using Sol Gel Method

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Bismuth oxide (Bi_2O_3) has been widely used as an electrode material (anode), solid fuel cell, gas sensor and photocatalyst. Applications of this material are related to its properties such as high conductivity, good dielectric permittivity, and band gap energy of 2-3,96 eV. Therefore, it is necessary to synthesize bismuth oxide with the product having the desired properties. In this paper we will discuss bismuth oxide synthesis by using sol gel method and characterization of its resulting product including XRD, FTIR, SEM, DRS-UV and its photocatalist activity test.



JCC2017302

Ascorbic Acid Encapsulation in Silica Gel from Teos/Mtes Precursor by Sol-Gel Process

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Self assembled hybrid organo-silica sol-gel materials are rapidly expanding for new and novel applications. The microporous solid silica matrix was used as a carrier for the controlled release of ascorbic acid (vitamin C), selected as cargo molecule. One-step synthesis procedure was optimized for the preparation of silica-molecule composites by using tetraethoxysilane (TEOS) and methyltriethoxysilane (MTES) as precursors. The hydrophobic silica xerogel matrices were characterized by Fourier Transform Infrared Spectroscopy (FTIR) and specific surface area and porosity parameters were determined by Brunauer-Emmett-Teller (BET) technique. Results shows that ascorbic acid was incorporated in a surface-modified silica xerogel acting as a carrier system. The rate of Ascorbic acid release from silica xerogel (TEOS/MTES=1:1) was faster than (TEOS/MTES=1:2), the loading amount of ascorbic acid was dependent on the surface of chemical moiety of silica xerogel and the steric effects of ascorbic acid structure.



JCC2017303

Method of ERASI (Electro Assisted Phytoremediation-Aeration) with Vetiveira Grass (*Vetiveira Zizaniodes L*) As Remediation of Heavy Metal Waste Fe and Cu

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Industrial, agricultural and mining activities were increasing so that heavy metal pollution in the aquatic plume becomes an important issue globally requiring a special attention to overcome the problem. One of pollutants source in the aquatic was heavy metals such as Fe and Cu since it is stable and difficult to remove, therefore it is necessary to do a remediation process. One of remediation method that can be used was a combination of EAPR (electro-assisted phytoremediation) and Aeration process with Vetiver grass (*Vetiveira zizanioides L*) as a pollutant accumulator species, hereinafter referred to as ERASI. The method was a phytoremediation process, with direct electric current flowing through the electrode material to assist the mobility of charged pollutants from a deep plume source to the direction of the plant roots. The air injection in the process was to increase the oxygen concentration in the solution. The aim of this study is to evaluate the ability of Vetiver grass to absorb Fe and Cu metal in a longer period of time on the heavy metal wastewater media by observing the qualitative and quantitative parameters i.e observation of plant morphology changing and decreasing concentration of Fe and Cu. In this study, three processes include of phytoremediation, phyto-aeration and ERASI were also compared for 7 days process. The results showed that the plant which has high absorption of Fe and Cu was on the ERASI treatment showing a high toxicity symptom such as wilting, dry and leave burn and decreasing of Fe and Cu. The decrease of Fe metal concentration in phytoremediation method is 56%, phyto-aeration 99,21% and ERASI 99,26%. While the concentration decrease for Cu metal in phytoremediation method is 15%, phyto-aeration method is 82,3% and ERASI equal to 86,5%. Plant chlorophyll concentration in the ERASI process showed that the plants experienced low level of stress compared to phytoremediation-aeration. Generally, it can be concluded that the ERASI process is the most effective process in reducing heavy metal concentrations from the other two processes.

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JCC2017304

Identification of Flavonoid Compounds from the Active Fraction of the α -Glucosidase Inhibitor from Carrot Leaves Extract (*Daucus carota* L.)

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The objective of this study was to obtain an active fraction of carrot leaf extract which potentially as α -Glucosidase inhibitor and to identify its flavonoid compound type. This study was initiated by the extraction of carrot (*Daucus carota* L.) leaves by percolation method using ethanol solvent and followed by vacuum liquid chromatography fractionation using n-hexane, ethyl acetate, and methanol solvents. Each fraction determined the activity of α -glucosidase inhibition by spectrophotometry. An active fraction having the strongest α -glucosidase inhibition is isolated and characterized its flavonoid content. The results showed that ethyl acetate fraction had the highest α -glucosidase inhibition activity (IC₅₀ = 170,639 ppm). The results of the characterization of flavonoid isolates from the ethyl acetate fraction were known to have λ_{\max} 342nm (band I) and 268nm (band II), functional groups O-H, C-H, C = O, C = C aromatics, C-O-C, and C-O. Spectroscopic UV-Vis analysis of isolate using shift reagents known that the isolate is a flavonoid compound which has three hydroxy groups at the position of carbon atom number= 5,7, and 4 'and allegedly as a flavon compound.

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JCC2017305

A New Sorbent of Silica Magnetite: The Influence of Variation of Sodium Silicate Concentration on The Character of The Silica Magnetite

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The adsorption capacity of the adsorbent was determined by the adsorbent and adsorbate properties. The character of the adsorbent will play a major role in its ability to adsorb the corresponding adsorbate. Therefore, we studied the effect of variation of sodium silicate concentration on the resulting magnetite silica adsorbent properties. The silica coating on the magnetite was carried out through a sol-gel process with a precursor of sodium silicate and HCl. Based on the characterization data it was found that the silica coating on magnetite can generally increase the resistance to acid leaching, increase the particle size, but decrease the magnetic properties of the magnetite. Based on GSA and XRD data successively it can be determined that an increased concentration of sodium silicate will increase surface area and amorphous structure.



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JCC2017306

**Effect of Potentials and Electric Charges Copper and Indium
Depositions to The Photocurrent Responses of CuInS₂ Thin Film
Fabricated By Stack Electrodeposition Followed by Sulfurization**

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Effect of potentials and electric charges copper and indium depositions to the photocurrent responses of CuInS₂ thin film fabricated by electrodeposition followed by sulfurization were investigated. The characterization and elemental compositions of as-deposited Cu/In and CuInS₂ thin films used X-RD and EDAX. Photocurrent responses of the obtained CuInS₂ thin films were analyzed by linear sweep voltammograms (*LSVs*) in europium solution under chopped irradiation. Photocurrent responses showed that fabricated CuInS₂ thin films had *p*-type photoresponses. Improving potentials and electric charges reduced the photocurrent responses of the semiconductor films, although from XRD and EDAX data had no significant different.



JCC2017307

Synthesis of 4-hydroxy-3-methylchalcone from Reimer-Tiemann Reaction Product and Its Antibacterial Activity Test

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A 4-hydroxy-3-methylchalcone has been synthesized from 4-hydroxy-3-methylbenzaldehyde as the Reimer-Tiemann reaction product. This research consists of three steps involve synthesise of 4-hydroxy-3-methylbenzaldehyde from ortho-cresol, synthesise of chalcone derivatives from 4-hydroxy-3-methylbenzaldehyde and 4-hydroxy-3-methoxybenzaldehyde or vanillin for the comparison, the last is antibacterial activity test of both chalcone derivatives against *Escherichia coli* (negative gram) and *Staphylococcus aureus* (positive gram) using disc diffusion method. Results of Reimer-Tiemann reaction is 4-hydroxy-3-methylbenzaldehyde compound in an orange colour solid form which has 43% yields and melting point 110-114°C. A 4-hydroxy-3-methylbenzaldehyde then reacted with acetophenone in a base condition and form 4-hydroxy-3-methylchalcone compound in a yellow colour solid form which has 40% yields and melting point 83-86°C. The antibacterial activity of the 4-hydroxy-3-methylchalcone against gram-positive bacteria *Staphylococcus aureus* is better than the 4-hydroxy-3-methoxychalcone.

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JCC2017308

Antiglycation and α -Glucosidase Inhibitory Properties of *Alpinia purpurata* K Schum Fermented by *Aspergillus niger*

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Red Galangal (*Alpinia purpurata* K. Schum) is widely used by Indonesian as traditional medicine. Previous study reported several activities such as anti-fungals, antioxidant, antidiabetic, anti-inflammatory and anticancer. In this study, effort to increase bioactive capacity of red galangal as antidiabetic have been performed. The rizhome treated by solid state fermentation using *Aspergillus niger*. The samples for activity assay harvested from culture that growth on stationary and death phase. In vitro antiglycation assay carried out using BSA-fructose model by determination of protein carbonyl contents, as well as hemoglobin glycation. The antidiabetic properties also perform using the enzyme inhibition for α -glucosidase. The results showed that antiglycation capacity and glucosidase inhibitory activities are higher in all fermented red galangal comparing to unfermented rizhome. The highest antiglycation activity showed by extract from fermented product of stationary phase as well as the total phenolic content. However, the highest activity for inhibition α -glucosidase shown by fermented product from early death phase. This results indicate that the fermented product of red galangal has potential to be used as nutraceutical.

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JCC2017309

Synthesis and Characterization of NaCo(1-x)MnxO₂ Solid Electrolyte Using Sol-Gel Method: The Effect of Milling Speed Variations

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Battery is a device that converts chemical energy into electrical energy through electrochemical process. Further research on the synthesis of cathode of Na-ion battery that has good conductivity to maximize the battery performance needs to be conducted. One of the production steps of the NaCo_(1-x)NaCo cathode synthesis in the Na-Ion battery was a ball-milling process, in which by the ball-milling process, the crystal size of NaCo_(1-x)Mn_xO₂ cathode can be minimized. The purpose of this study was to determine the effect of variation of ball-milling speed to the characteristics of resulting product including the oxide types composing NaCo_(1-x)Mn_xO₂ cathode, surface morphology, and conductivity. The main ingredients used were sodium acetate, manganese acetate, cobalt acetate with molar ratio of 0.7: 0.66: 0.22, respectively and citric acid as chelating agent with the M/CA ratio of 1: 1. The variations of milling speed were 0, 300, 400, 500, 600 and 700 rpm. Characterization of the product was conducted using XRD, SEM-EDS, and conductivity meter (LCR-meter). The result showed that a solid electrolyte of NaCo_(1-x)Mn_xO₂ consisting of NaMnO₂, NaO₂, CoO, Co₂O₃, MnO₂ components was successfully synthesised. The observation on the milling speed at 400 rpm showed that the solid electrolyte produced had the highest conductivity i.e. $4.08 \times 10^{-6} \text{ Scm}^{-1}$ with a homogeneous surface morphology and had a spinel formula NaCo_{0,65}Mn_{0,35}O₂.



JCC2017310

The Impact of Template Types on Polieugenol to The Adsorption Selectivity of Ionic Imprinted Polymer (Iip) Ion Metal Fe

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The synthesis of IIP was carried out by variation of Fe(III) ion templates from $\text{Fe}(\text{NO}_3)_3$, $\text{K}_3[\text{Fe}(\text{CN})_6]$ and $\text{NH}_4\text{Fe}(\text{SO}_4)_2$ compounds which then tested IIP selectivity to the Fe metal ions through adsorption process. Ionic Imprinted Polymer (IIP) is a method of printing metal ions bound in a polymer, subsequently released from the polymer matrix to produce a suitable imprint for the target ion. The purposes of this study were to produce IIP from $\text{Fe}(\text{NO}_3)_3$, $\text{K}_3[\text{Fe}(\text{CN})_6]$ and $\text{NH}_4\text{Fe}(\text{SO}_4)_2$ templates, to know the effect of templates on adsorption selectivity of IIP involving imprint cavity, and to know the impact of metal competitor on the selectivity adsorption of IIP to the Fe metals. The results obtained showed that IIP synthesized by variations of $\text{Fe}(\text{NO}_3)_3$, $\text{K}_3[\text{Fe}(\text{CN})_6]$ and $\text{NH}_4\text{Fe}(\text{SO}_4)_2$ templates was successfully synthesized. The adsorption selectivity of Fe (III) metal ion in the $\text{Fe}(\text{NO}_3)_3$ template was greater than that of in the $\text{K}_3[\text{Fe}(\text{CN})_6]$ and $\text{NH}_4\text{Fe}(\text{SO}_4)_2$ templates. The adsorption selectivity of Fe was greater on Fe-Cr compared to on Fe-Cd and Fe-Pb.



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Antidiabetic Activity from Cinnamaldehyde Encapsulated by Nanochitosan

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Diabetes mellitus (DM) is a disease characterized by chronic hyperglycemia and metabolic disorders of carbohydrates, proteins, and fats due to reduced function of insulin. Treatment of diabetes can be done by insulin therapy or hypoglycemic drugs. Hypoglycemic drugs usually contain compounds that can inhibit the action of α -glucosidase enzymes that play a role in breaking carbohydrates into blood sugar. Cinnamaldehyde has α -glucosidase inhibit activity because it has a functional group of alkene that is conjugated with a benzene ring and a carbonyl group. However, the use of this compound still provides unsatisfactory results due to its degradation during the absorption process. The solution offered to solve the problem is by encapsulated it within chitosan nanoparticles that serve to protect the bioactive compound from degradation, increases of solubility and delivery of a bioactive compound to the target site by using freeze-drying technique. The value of encapsulation efficiency (EE) of cinnamaldehyde which encapsulated within chitosan nanoparticles is about 74%. Inhibition test result showed that cinnamaldehyde-chitosan nanoparticles at 100 ppm could inhibit α -glucosidase activity in 23,9% with 134,13 in IC₅₀. So it can be concluded that cinnamaldehyde can be encapsulated in nanoparticles of chitosan and proved that it could inhibit α -glucosidase.



JCC2017312

Chitosan-Tripoly phosphate (CS-TPP) Synthesis through Cross-Linking Process: The Effect of Concentration towards Membrane Mechanical Characteristic and Urea Permeation

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Membrane from natural chitosan polymer are widely used in biomedical application because its particular characteristics such as biocompatible, biodegradable, non toxic, and its permeability. This study is aimed to modify chitosan structure with tripolyphosphate groups to enhance chitosan ability in urea permeation process. To obtain compound with the required characteristics, study of TPP concentration effect towards membrane characteristics was conducted, it included water uptake, tensile strength, hydrophilicity, and urea permeation ability. The result shows that ratio concentration of tripoly phosphate on chitosan affects the membrane's urea permeability. Polyvinyl alcohol and poly ethylene glycol blended to membrane forming process functioned as supporting material and enhanced membrane strength during permeation process.



JCC2017313

Modification of Natural Zeolite with Fe (III) and Its Application As Adsorbent Chloride and Carbonate ions

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Modification of natural zeolite with Fe (III) using anion exchange process to improve the anion exchange capacity of the zeolite. Natural zeolite was activated using HNO₃ 1 N and then mixed with FeCl₃ solution and refluxed followed by oven and calcination at a temperature of 550°C. the influence of Fe (III) to zeolite was characterized by FTIR while to detect the presence of Fe in zeolite were characterized by AAS. Zeolite and Zeolite-Fe adsorption capacity of both anion (chloride and carbonate) was determining through a process of adsorption by variation of pH and contact time, and then to determining the Fe adsorbed concentration at Zeolite using UV-Vis spectrophotometer. FTIR analysis result showed that the addition of Fe does not affect the zeolite's structure but change the intensity of the zeolite spectra. Analysis by AAS obtained the Fe concentration in Zeolite-Fe of 5,714 mg/L indicating that Fe was present in the zeolite. Both Zeolite and Zeolite-Fe adsorption results showed that optimum pH of Chloride anion is 2, with adsorption capacity $2,33 \times 10^{-3}$ g/g and optimum contact time is 8 minutes. While Zeolite and Zeolite-Fe adsorption results showed that optimum pH of Carbonate anion is 5, with adsorption capacity $5,31 \times 10^{-3}$ g/g and optimum contact time is 8 minutes.

Keywords: Natural Zeolite, Zeolite-Fe, Chloride Anion, Carbonate Anion and Adsorption



JCC2017314

The Effect of Ca/P Ratio to The Formation of β -TCP by Sol-Gel Method

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Beta-Tricalcium phosphate (β -TCP, β -Ca₃(PO₄)₂) is a bioactive material that can be used as powder phase of bone cement. In this study, β -TCP was synthesized by sol-gel method with different Ca/P ratio in ethanol media. Calcium nitrate tetrahydrate and phosphorous penta oxide were used as calcium and phosphorous precursors, respectively. The reaction was conducted at room temperature and continued by dried process at 80°C for 20 hours to produce amorphous calcium phosphate (ACP). Transformation of amorph to crystalline phase was done by firing process at 800°C for 30 minutes. The results showed that pure β -TCP powders were obtained from Ca/P ratio of 1.0 – 1.3 and for Ca/P ratio of 1.4 – 1.5, a secondary product of hydroxyapatite (HA, Ca₁₀(PO₄)₆(OH)₂) were found. The crystallite size of β -TCP was counted between 32.96 and 47,82 nm. Morphology changed due to Ca/P ratio in which irregular shape of β -TCP became bigger as Ca/P ratio increase from 1.0 to 1.3. The presense of hydroxyapatite has changed the morphology by reducing β -TCP grain size.



JCC2017315

Isolation, Identification and Xanthine Oxidase Inhibition Activity of Alkaloid Compound from *Peperomia pellucida*

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The research of the isolation and xanthine oxidation inhibition activity of alkaloid compound from *Peperomia pellucida* has been carried out. Alkaloid extract is isolated by column chromatography and preparative TLC. Alkaloid isolate is identified spectroscopically by UV-Vis spectrophotometer, FT-IR, and LC-MS/MS. Xanthine oxidase inhibition activity is carried out by in vitro assay. The result showed that the alkaloid isolate probably has piperidine basic structure. The alkaloid isolate has N-H, C-H, C = C, C = O, C-N, C-O-C groups and aromatic ring. The IC₅₀ values of ethanol and alkaloid extract are 71.6658 ppm and 76.3318 ppm, respectively. Alkaloid extract of *Peperomia pellucida* showed higher activity than ethanol extract.



JCC2017317

The Spectrophone: Utilization of Android-base Smartphone to support handmade spectrophotometer

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Visible spectrophotometer is a powerful instrument in chemistry. We can identify the chemical species base on their specific color and then we can also determine the amount of the species using the spectrophotometer. However, the availability of visible spectrophotometer still limited, particularly for education. This affect the skill of student to have experience on handling the instrumentation. On the other hand, the communication technology creates an opportunity for student to explore their smart feature, mainly the camera. The objective of this research is to make an application that utilize the camera feature as a detector for handmade visible spectrophotometer. The software have been made based on android program, and we name it as Spectrophone®. Our preliminary result on designing a handmade spectrophotometer are shown in Figure 1. The spectrophotometer consists of an acrylic body, sample compartment, and light sources (USB-LED lamp powered by 6600 mAh battery). Before reach the sample, the light source was filtered using colored-mica plastic.

Figure 2 shows the appearance of Spectrophone® apps. This apps utilize the camera to detect the color based on its RGB composition. A different colored solution will show a different RGB composition based on the concentration and specific absorbance wavelength. We then can choose one type of color composition, R or G or B only to be converted as an absorbance using -Log (Cs/Co), where Cs and Co are color composition of sample and blank, respectively. In Figure 2, we can see the calibration curve of Fe³⁺ measured as a complex with SCN⁻ ion. In a blue (B) composition, the regression is not linear ($R^2=0.17$) compare to the result of UV-Vis spectrophotomer model Spectroquant Pharo 300 ($R^2=0.912$). This measurement result shows that The Spectrophone® still need to be evaluated and corrected. One problem than can we identify that the diameter of pick point of RGB composition is too wide and this will affect the reading color composition. Next, we will fix the problem and in advance we will apply this Spectrophone® in a wide scale.



JCC2017318

Degradation of Cr(VI) in Batik Liquid Waste Using Advanced Oxidation Processes

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Along with the growth and development of batik industry, the greater volume of liquid waste is produced. Batik industrial wastewater is reported to contain heavy metals. The presence of heavy metal especially chromium in batik industrial wastewater can cause negative impact to environment and public health. Heavy metal chromium especially Cr (VI) is one of the heavy metals found in batik liquid waste derived from dyes used in staining such as CrCl_3 and $\text{K}_2\text{Cr}_2\text{O}_7$ or dye binders such as $\text{Cr}(\text{NO}_3)_2$. The degradation of Cr (VI) heavy metals contained in batik wastewater has been carried out using the Advanced Oxidation Process method (AOP). This method is widely developed because it has advantages such as practical, safe and environmentally friendly. The AOP system used is $\text{TiO}_2/\text{H}_2\text{O}_2/\text{UV}$. The purpose of this research is to know the effect of UV irradiation time, the concentration of H_2O_2 and the best amount of TiO_2 to degrade heavy metal Cr (VI). Based on the result of the research, it is known that the best irradiation time to degrade Cr (VI) is 3 hours, H_2O_2 concentration is 50 ppm, and the amount of TiO_2 is 40 mg, with Cr (VI) decrease by 87%.



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Antidiabetic Activity From Cinnamaldydhe Encapsulated by Nanochitosan

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Diabetes mellitus (DM) is a disease characterized by chronic hyperglycemia and metabolic disorders of carbohydrates, proteins, and fats due to reduced function of insulin. Treatment of diabetes can be done by insulin therapy or hypoglycemic drugs. Hypoglycemic drugs usually contain compounds that can inhibit the action of α -glucosidase enzymes that play a role in breaking carbohydrates into blood sugar. Cinnamaldehyde has α -glucosidase inhibit activity because it has a functional group of alkene that is conjugated with a benzene ring and a carbonyl group. However, the use of this compound still provides unsatisfactory results due to its degradation during the absorption process. The solution offered to solve the problem is by encapsulated it within chitosan nanoparticles that serve to protect the bioactive compound from degradation, increases of solubility and delivery of a bioactive compound to the target site by using freeze-drying technique. The value of encapsulation efficiency (EE) of cinnamaldydhe which encapsulated within chitosan nanoparticles is about 74%. Inhibition test result showed that cinnamaldehyde-chitosan nanoparticles at 100 ppm could inhibit α -glucosidase activity in 23,9% with 134,13 in IC₅₀. So it can be concluded that cinnamaldehyde can be encapsulated in nanoparticles of chitosan and proved that it could inhibit α -glucosidase.

Keyword: Cinnamaldehyde, Encapsulated, antidiabetic



Sorption Isotherm Modelling Of Fermented Cassava Flour by Red Yeast Rice

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The objective of the study is to determine the characteristic of moisture sorption isotherm from fermented cassava flour by red yeast rice using various modelling. This research used 7 salt solutions and storage temperature of 298K, 303K, and 308K. The models used were Brunauer-Emmet-Teller (BET), Guggenheim-Anderson-de Boer (GAB) and Caurie model. The monolayer moisture content was around 4.51 – 5.99% db. kb value of GAB model was around 0.86-0.91. c value of GAB model was around 4.67-5.97. C value of BET was around 4.83-7.04. Whereas the c value in Caurie model was around 1.25-1.59. The equilibrium and monolayer moisture content on fermented cassava flour by red yeast rice was decreasing as increasing temperature. GAB constant value indicated that the process of moisture absorption on the fermented cassava flour by red yeast rice categorized in type II.



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The Catalytic Activity of CoMo/USY on Deoxygenation Reaction of Anisole In A Batch Reactor

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The catalytic hydrodeoxygenation of the bio oil model compounds (biomass pyrolysis results) typically uses sulphide catalysts. In this study, we studied the activity of non sulphide catalyst, the effect of temperature and reaction time on anisole deoxygenation. The catalytic activity was performed in a batch reactor using N₂ gas at 1 bar of pressure. The product was analyzed by gas chromatography (GC) and gas chromatography-mass spectrometry (GC-MS). The result showed that the Co-Mo/USY catalyst has the highest activity and produces oxygen-free products, pentamethylbenzene, when reaction time is 2 hours. The Co-Mo/USY catalysts have the value of the total yield of the product increased with time increase drastically.

Keyword: anisole, CoMo/USY, deoxygenation, batch reactor.



JCC2017PLS

Antifungal Activity of Crude Extracellular Chitinase from *Bacillus subtilis* B298 towards *Rhizoctonia solani*

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Chitinase is a hydrolase enzyme capable of degrading chitin compounds randomly on the glycosidic chain. Chitinolytic bacteria can degrade chitin constituent cell wall of plant pathogenic fungi so it is potential to be utilized as biocontrol agent. *Bacillus subtilis* B298, an antagonistic bacteria isolated from potato rhizosphere in the highlands of Serang Village Karangreja Subdistrict Purbalingga Regency is able to produce extracellular chitinase enzyme. The objective of this study was to determine the ability of chitinase enzyme from *Bacillus subtilis* B298 in inhibiting the growth of pathogenic fungi *Rhizoctonia solani* and MIC (Minimum Inhibitory Concentration) value. Antifungal activity assay of *B. subtilis* B298 crude extracellular chitinase in inhibiting *Rhizoctonia solani* was performed by diffusion method, determination of MIC value (Minimum Inhibitory Concentration) and lysis test of fungal cell wall. The results showed that the crude extract of chitinase was able to inhibit the growth of *R. solani* fungus with clear zone of 4.983 mm. The value of MIC was achieved at a 5% chitinase concentration. Fungal cell lysis test showed that the crude extract of chitinase was able to degrade the fungus cell wall with increasing activity from 0 to 12 hours incubation.



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Guided Cooperative Flipped Classroom Approach in Learning Molecular Orbital Theory

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The purpose of the study is to investigate whether innovative approach called Guided Cooperative Flipped Classroom can be accepted by students during the learning of Molecular Orbital. Molecular Orbital theory is one of the topics taught in Inorganic Chemistry for non-major chemistry students. This course is enrolled by pre-service teacher major or minor in chemistry. Although the concept embedded in the Flipped *Classroom* has been globally accepted, it is the first time the approach was introduced to the students. Unlike other courses, students always have negative perceptions toward Chemistry such as the difficulty to understand and to pass the examination. Case study approach was adopted to discover the degree of the acceptance based on the students' comprehension through informal interview, observation and performance. The study is carried out with four learning cycles; Intentional Content Approach, Higher Order Thinking Activities, Sharing Session and Feed-Forward Feedback Session. Majority of the students has pointed out how the approach was deemed to be much better way of learning inorganic chemistry in comparison to traditional one. The students also believed that it was the first time they had the opportunity to study chemistry in meaningful ways. Hence, it could be profoundly concluded that the Guided Cooperative Flipped Classroom is suited to be used as an alternative approach in understanding Molecular Orbital Theory.

Keywords:

Guided Cooperative Flipped Classroom, Molecular Orbital Theory, Action Research, Higher Order Thinking Activities.



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JCC2017SSS

Implementation of project-based learning to the ability of scriptural literates on highschool student class xi

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This research uses experimental method which is aimed to know the difference of science literacy ability toward science based model based learning project on hydrolysis material and buffer solution. This research was conducted in SMA Negeri 2 Salatiga. Design The research used is Pretest - Posttest Control Group Design. The sample used is two classes chosen by cluster random sampling technique. Methods of data collection in the form of documentation, observation and test methods. The project work done by the students is the making of shampoo from rice husk. The data obtained were then analyzed using the N gain and t test. The result of gain normality test obtained average science literacy ability of posttest result increased 0,77 and 0,69 with high category in experiment class and while in control class. In addition, t test analysis showed that the tcount of 3,660 is greater than ttable 2,002 with 5% significance level which means there is a significant improvement difference between experiment class and control class. In addition, the determination coefficient test obtained value of 0.6 with the category of influence of Project Based Learning Model is strong. Based on the results of the analysis can be concluded that the application of Model Based Learning on the ability of science literacy is more significant than the Conventional Model.

Keywords: Project Based Learning, Hydrolysis, Buffer Solution and Science Literacy..



JCC2017BBB

Development of ultrasonic-assisted extraction of antioxidant compounds from Petai (*Parkia speciosa* Hassk.) leaves

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Research on Petai (*Parkia speciosa* Hassk.) suggests it has an antihypertension, antidiabetic, analgesic, and antiulcer effects. In the present study, an ultrasonic-assisted extraction method was developed for the effective extraction of active compound from petai leaves. Some parameters such as ethanol concentration (0, 20, 40, 60, 70, 80, 100 %v), solid-to-liquid ratio (1:5; 1:10; 1:15; 1:20; 1:25; 1:30; 1:35; 1:40; 1:50 g/mL), extraction time (15, 20, 25, 30, 35, 40, 50 minutes) and extraction temperature (40, 45, 50, 55, 60, 65, 70°C) were studied and evaluated base on extract yield and 1,1-diphenyl-2-picryl hydrazyl (DPPH) scavenging activity. The result showed that the highest extract yield was obtained at 40% ethanol concentration, 1:30(%w/v) of solid-to-liquid ratio, 30 minutes and 65°C of temperature with DPPH scavenging activity 92.53±0.87% and extract yield 21.25±2.38%. The result obtain are helpful for the utilization of Petai leaves, and also indicated that ultrasonic-assisted extraction is very recommended method for the extraction of active compounds from plant material.



JCC2017MMM

Improvement the Yoghurt nutritional value, organoleptic properties and preferences by Spirulina (*Spirulina platensis*) Supplementation

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Spirulina sp has been identified as potential source food functional such as protein, amino acids and other high added value compounds from microalgae. One of the compounds is phycocyanin as also known for antioxidant use. Probiotic products roles increase the body immune, antioxidant, antipainflammatory, dislipidemia. Probiotic will increase the nutritional value and preferences by *Spirulina* supplementation. This research was aimed to increase the nutritional value and organoleptic properties and preferences by *Spirulina* Plantesis supplementation.

Completely randomized controlled group design conducted by 31 respondents. Research accomplished in Food Technology, Microbiology and Chemistry Laboratory at Bandung Health Polytechnic in Bandung by 2017. Samples divided randomly into three groups: (1) yoghurt standard supplemented 50 ml, (2) yoghurt and spirulina 1% supplemented 50 ml, (3) yoghurt and spirulina 1,2% supplemented 50 ml. Spirulina was added concentration by 0, 1, 1,2 % calculated by dx trial. Preference test was measured by organoleptic test. MPN, microbe, pH, microbial contamination was measured by Microbiology test. Proximate analysis measured by AOAC. Data were analyzed by statistics programme significance level $p < 0,05$.

Organoleptic test revealed there was significant difference among the parameters of colour ($p < 0,001$), taste ($p < 0,020$) and consistency ($p < 0,001$) except aroma ($p < 0,390$). The control group was dissimilar among yoghurt. Group enriched spirulina was accepted even the blue colour. Proximate analysis was reveal the highest protein in enriched by spirulina 1%, however fat was lower 3,48 - 3,56 compare to control. All products found growing *Lactobacillus acidophilus* with a pH of 4.0 ranges. There was no microbial contamination such as *E coli*, *Salmonella* sp, *Pseudomonas* sp.



JCC2017SHR

Productive Liquid Fertilizer from Liquid Waste Tempe Industry as Revealed by Various EM4 Concentration

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Recently, using of productive liquid fertilizer assumed as a proper and practical fertilizer for plant productivity purposes. Various ways of enrichment of liquid fertilizer is done to achieve certain quality. The purpose of this research was to determine the proper additional formulation in the process of making productive liquid fertilizer based on the various concentration of EM4 as well as compared the result with SNI. Liquid tempe wastewere collected from some tempe industriesat Sidorejo Kidul village, Tingkir district, Salatiga. The concentration of EM4 which were added to the tempe wastewater are 0%; 0.20%; 0.40%; 0.60%; 0.80%; 1.00% respectively. The pH, temperature, C total, N total, C/N ratio, and PO_4^{3-} weremeasured. Data was analyzed by using Randomize Completely Block Design (RCBD)with 6 treatments and 4 replications. Comparison between the average, the Honestly Significance Deference (HSD) 5% was used.The results showed that the addition of EM₄indicated there were a significant progress. Moreover, the most effectiveformula to increase the quality of productive liquid fertilizer from liquid waste tempe was found in addition of 1.00% EM4 with the gained analysis value for the C total, N total, C/N ratio, and degree of PO_4^{3-} as follows : $4.395 \pm 1.034\%$; $1.470 \pm 0.081\%$; 3.01 ± 0.756 ; 685.28 ± 70.44 ppm . Associated with the need fulfillment of SNI hence can be concluded that result of Productive Liquid Fertilizer (PLF) from liquid waste tempe successfully fulfill SNI of liquid fertilizer for pH parameter and total N, only.

Key words : EM₄, liquid tempe waste, productive liquid fertilizer



JCC2017BCH

Characteristics of eugenol loaded chitosan-tripolyphosphate particles as affected by initial content of eugenol and their *in-vitro* release characteristic

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The aim of this research was to determine encapsulation efficiency of products, which prepared by coaservation method and release characterization of eugenol loaded chitosan-tpp. The influences of the initial eugenol content on loading capacity (LC) and encapsulation efficiency (EE) of eugenol-loaded chitosan-tpp particles were also investigated. The success of eugenol encapsulation was confirmed by UV-vis spectrophotometry, Fourier Transform Infrared (FTIR) spectroscopy, and Scanning electron microscopy (SEM) techniques. In the preliminary research we found that molecular weight of chitosan 624.739 kDa with deacetylation degree 64,2 %. Characteristic of eugenol-loaded chitosan showed that %EE and % LC increased with increasing of initial eugenol content. The optimum %EE (72,63%) and %LC (43,96%) were obtained by ratio of chitosan to eugenol of 1:1,5. In the FTIR spectrum showed the characteristic peaks of eugenol appearing on spectrum of eugenol encapsulated and blue-shift in the hydroxyl band from 3425,58 cm⁻¹ in chitosan-tpp to 3417,86 cm⁻¹ and 3394,72 cm⁻¹ in eugenol loaded chitosan-tpp suggests that eugenol was successfully encapsulated. The surface morphologies of freeze-dried particles with the optimum %EE showed more surface roughness and porosity than plain particles. Furthermore, the *in vitro* release of particles with minimum and optimum %EE were also investigated in acid (Simulated Gastric Fluid) and base (Simulated Intestinal Fluid) medium at ambient temperature. The results suggested that particles with minimum EE had higher release than optimum EE.

Keywords : chitosan, tripolyphosphate, eugenol, encapsulation, *in vitro* release



JCC2017MUF

Synthesis, characterization, and application of mesoporous Fe₂O₃/SBA-15 silica material sieves for adsorption nickel (II) ions

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Synthesis, Characterization, and Application of Mesoporous Fe₂O₃/SBA-15 Silica Material Sieves to Adsorption of Nickel (II) Ions. In the study, activation of SBA-15 using HCl solution and synthesis of Fe₂O₃/SBA-15 silica mesoporous material using wet impregnation, ultrasonic, and microwave method. The optimum ability of Fe₂O₃/SBA-15 silica mesoporous material in adsorption of nickel(II) ions is studied with contact time parameters. The quantitative analysis of nickel (II) ions in the filtrate was checked by the AAS method. The result data of optimum contact time was analyzed with adsorption kinetics model. The analysis of Fe₂O₃/SBA-15 silica mesoporous material structures using FTIR (*Fourier Transform Infrared*), XRD (*X-Ray Diffraction*), BET (*Brunaur Emmett Teller*), TEM (*Transmission Electron Microscopy*), and EDX (*Energy Dispersive X-Ray*). The result of FTIR analysis showed that mesoporous Fe₂O₃/SBA-15 silica material sieves had silanol (Si-OH), siloxyl (Si-O-Si), and Fe-O, while the XRD analysis showed that Fe was impregnated on SBA-15 is iron oxide Fe₂O₃. Fe₂O₃/SBA-15 mesoporous silica material with a surface area of 479 m²/g, a pore volume of 0.87 cc / g, and a pore diameter of 6.50 nm. The optimum contact time of adsorption of Fe₂O₃/SBA-15 mesoporous material to Ni (II) ion was 240 minutes with optimum adsorption capacity of 352.982 mg / g. The optimum contact time data shows that the Fe₂O₃/SBA-15 silica mesoporous material in adsorption of nickel (II) ions follows the Lagergren kinetic model.

Keywords: mesoporous silica SBA-15, iron oxide Fe₂O₃, wet impregnation, ultrasonic, microwave, adsorption, Ni²⁺ ions



JCC2017RAW

Moving towards a greener future. From waste to wealth: oil palm biomass-based bionanocomposite

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The current practice of large oil palm plantations passively dumping as well as openly burning unwanted oil palm fronds leaves (OPFL) are aesthetically displeasing and contributes to poor regional air quality along with increased health problems. Such disposal methods are environmentally challenging and unsustainable in the long run. Since the full benefits of this consistently generated biomass is not fully explored, more research into the development of new technological applications for OPFL warrants attention of the scientific community. Our study bleached, alkaline treated and acid-hydrolyzed OPFL to obtain purified nanocellulose (NC). X-Ray diffractogram revealed the extracted NC was crystalline with a crystallinity index of 70.2%, indicating its suitability as nano-fillers to prepare the chitosan/nanocellulose (CS-NC) supports to immobilize *Candida rugosa* lipase (CRL) to produce the CRL/CS-NC biocatalysts. Results of FTIR-ATR, TGA, FESEM, XRD, Raman spectroscopy and fluorescence optical microscopy revealed that the CRL molecules were successfully bound to the surface of CS-NC supports via imine bonds formed through a Schiff's based mechanism. The results strongly indicated that CS was highly hydrogen bonded to the NC. Under an optimized condition, the highest conversion of butyl butyrate at 88% was obtained in just 3 h of incubation, using an immobilization temperature of 25 °C, 0.3% concentration of glutaraldehyde and immobilization buffer at pH 7. Under an optimized condition [3 h, 50 °C, molar ratio of acid/alcohol of 1:2, 200 rpm and 3 mg/mL CRL/CS-NC], the efficacy of CRL/CS-NC was compared with the free CRL, which showed that 90.2% of butyl butyrate was produced by the former as compared to 62.9% in the free CRL [3 h, 40 °C, molar ratio of acid/alcohol of 1:2, 200 rpm and 5 mg/mL CRL]. FTIR-ATR and NMR analyses on the purified butyl butyrate confirmed that the ester was successfully synthesized. Thermal stability of CRL/CS-NC was improved by 1.5-fold over the free CRL, and the biocatalyst was reusable for up to 8 successive esterification cycles. The CRL/CS-NC-catalyzed esterification process followed a Ping-pong Bi-Bi mechanism model (V_{\max} 4.5 mM min⁻¹) with butanol inhibition ($K_{i,B}$ 69.05 mM) and showed a greater preference for butyric acid ($K_{m,A}$ 155.52 mM) over butanol ($K_{m,B}$ 917.78 mM). In a nutshell, it can be concluded that NC sourced from discarded OPFL was suitable as a raw material to prepare a highly functional CS-NC support. Activity of CRL/CS-NC was satisfactorily improved to allow rapid and high yield synthesis of butyl butyrate. It can be construed that the developed CRL/CS-NC is a feasibly practical and greener substitute over the conventional homogenous acid catalyst used to synthesize butyl butyrate.



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Chiral separation of selected antifungal drug by capillary electrophoresis and high performance liquid chromatography

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ABSTRACT. Chiral separation is one of the important fields of modern analytical chemistry, especially for pharmaceutical and agrochemical products because the stereochemistry has a significant influence on the biological activities of compounds. It is well known that the enantiomers (optical isomers) differ in their pharmacological and toxicological activities. One of the enantiomers can be inactive or toxic. Chiral separation of the antifungal drug (miconazole) has been developed in this study using capillary electrophoresis (CE) and high performance liquid chromatography (HPLC) methods. In addition, the optimized HPLC method has been successfully applied for quantitative determination of miconazole in the pharmaceutical sample (powder).

Key words: Chiral separation, CE, HPLC, Antifungal drug.



JCC2017AMF

Cryogel as an immobilized Support Material for the Development of Biosensors

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Abstract. Recent development in the biosensor technologies has been remarkable. One of the strategies to improve biosensor was the use of porous material of cryogel, which was simply to prepare by freezing and thawing the polymer. This paper describes the use of some cryogel base supporting material in the biosensor development. Cryogel based biosensor has been developed showed advantages mainly in the biosensor stability and sensitivity improvement. Chitosan cryogel was used to immobilize enzyme in the glucose biosensor using amperometric detector. The glucose biosensor showed high stability up to 300 reusabilities. Further improvement strategy was used chitosan-grafted polyaniline in the sialic acid biosensor development. This cryogel greatly improve the biosensor sensitivity. Another material combination as cryogel backbone was also studied using chitosan-acrylamide to prepare a molecularly imprinted polymer (MIP) for micro-albumin detection. This cryogel showed advantages the combination between the porous material of cryogel and simply MIP preparation. The simple detection system of cryogel biosensors was also developed using chitosan and alginate. This cryogel were immobilized in a micropipette tips, including the immobilized glucose oxidase enzyme. The method operation of the biosensors was used micropipette. This simple biosensor showed high stability in the glucose sample detection.

Keyword: alginate cryogel, biosensors, chitosan cryogel, glucose biosensor, MIP



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The Catalytic Activity Of CoMo/USY On Deoxygenation Reaction Of Anisole In A Batch Reactor

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Abstract. The catalytic hydrodeoxygenation of the bio oil model compounds (biomass pyrolysis results) typically uses sulphide catalysts. In this study, we studied the activity of non sulphide catalyst, the effect of temperature and reaction time on anisole deoxygenation. The catalytic activity was performed in a batch reactor using N₂ gas at 1 bar of pressure. The product was analyzed by gas chromatography (GC) and gas chromatography-mass spectrometry (GC-MS). The result showed that the Co-Mo/USY catalyst has the highest activity and produces oxygen-free products, which are pentamethylbenzene, when the reaction time is 2 hours. The Co-Mo/USY catalyst has the value of the total yield of the product increased with time increase drastically.

Keyword: anisole, CoMo/USY, deoxygenation, batch reactor.



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Guided Cooperative Flipped Classroom Approach in Learning Molecular Orbital Theory

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The purpose of the study is to investigate whether innovative approach called Guided Cooperative Flipped Classroom can be accepted by students during the learning of Molecular Orbital. Molecular Orbital theory is one of the topics taught in Inorganic Chemistry for non-major chemistry students. This course is enrolled by pre-service teacher major or minor in chemistry. Although the concept embedded in the Flipped Classroom has been globally accepted, it is the first time the approach was introduced to the students. Unlike other courses, students always have negative perceptions toward Chemistry such as the difficulty to understand and to pass the examination. Case study approach was adopted to discover the degree of the acceptance based on the students' comprehension through informal interview, observation and performance. The study is carried out with four learning cycles; Intentional Content Approach, Higher Order Thinking Activities, Sharing Session and Feed-Forward Feedback Session. Majority of the students has pointed out how the approach was deemed to be much better way of learning inorganic chemistry in comparison to traditional one. The students also believed that it was the first time they had the opportunity to study chemistry in meaningful ways. Hence, it could be profoundly concluded that the Guided Cooperative Flipped Classroom is suited to be used as an alternative approach in understanding Molecular Orbital Theory.

Keywords:

Guided Cooperative Flipped Classroom, Molecular Orbital Theory, Action Research, Higher Order Thinking Activities.



JCC2017WST

Comparison of Conventional and Microwave-assisted Synthesis of Benzimidazole Derivative from Citronellal in Kaffir lime oil (*Citrus hystrix* DC.)

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Abstract. Simple method has been used for the synthesis of benzimidazole derivative of citronellal in kaffir lime oil under microwave irradiation. These compounds were synthesized also by conventional heating for comparison. In addition, microwave-assisted synthesis was also compared between using dichloromethane and methanol solvents with variation of reaction time for 30 to 70 minutes and 4 to 12 h for conventional heating. The 2-citronellyl benzimidazole compound synthesized were characterised by FT-IR, GC-MS, ¹H and ¹³C NMR spectroscopy. Comparison between conventional and microwave-assisted synthesis was done by comparing between correlation of reaction time and percentage yield. The time optimum of microwave-assisted and conventional synthesis using dichloromethane solvent respectively at 60 minutes (yield 19.23%) and 8 hours (yield 11.54%). In addition, the microwave-assisted synthesis increasing 157.81 times compared by conventional heating. While using methanol solvent tends to increase linearly however the percentage of yield only 0.77 times of synthesis using dichloromethane solvent.