

ISBN : 978-979-98623-1-0



UPN VETERAN JATIM

BALI  **tech**
BALI 22-23 JULY 2011
BALI INTERNATIONAL SEMINAR
on Science and Technology



UDAYANA UNIVERSITY

PROCEEDINGS

Bali International Seminar on Science and Technology

FACULTY OF INDUSTRIAL TECHNOLOGY - UPN "VETERAN" JATIM
CHEMISTRY DEPARTMENT, BIOMEDICINAL POSTGRADUATE PROGRAM
UDAYANA UNIVERSITY

PROCEEDINGS



Bali International Seminar on Science and Technology

*"Strengthening Basic Sciences and
Technology For Industrial Sustainability"*

"Organized by :

FACULTY OF INDUSTRIAL TECHNOLOGY
UPN "VETERAN" JAWA TIMUR
AND

CHEMISTRY DEPARTMENT, BIOMEDICINAL POSTGRADUATE PROGRAM
UDAYANA UNIVERSITY



PREFACE

Faculty of Industrial Technology of Universitas Pembangunan Nasional "Veteran" Jawa Timur in collaboration with Chemical Department and Biomedicinal Postgraduate Study Program of Udayana University are organizing an international seminar entitled: Bali International Seminar on Science and Technology , BISSTECH 2011

Total Participants more than 200 people in which 100 are paper and poster presenters, 17 papers are international from Malaysia, Canada and Australia while the rests of the papers are domestic from all over Indonesia.

We wish to thanks reviewers, plenary Speakers, keynote Speakers, and session moderators for their cooperation and valuable suggestions. We would like to extend our appreciation to members of organizing committees of all events during this seminar.

*Editorial Board
BISSTECH 2011*



EDITORIAL BOARD

- ❖ Prof. I GedeWenten (ITB, Indonesia)
- ❖ Associate Prof. David J Young (UBD, Brunai)
- ❖ Prof. Edward R.T Tiekink (University of Malaya, Malaysia)
- ❖ Prof. J.C. Liu (NTUST, Taiwan)
- ❖ Prof. Renanto Handogo (ITS, Indonesia)
- ❖ Prof. Achmad Roesyadi (ITS, Indonesia)
- ❖ Prof. Sri Redjeki (UPN Veteran Jawa Timur, Indonesia)
- ❖ Prof. Soemargono (UPN Veteran Jawa Timur, Indonesia)
- ❖ Prof. Tri Widjaja (ITS, Indonesia)
- ❖ Prof. Ida Bagus Putra Manuaba
(Udayana University, Indonesia)
- ❖ Dr Endra Julianto (ITB, Indonesia)
- ❖ Prof. Ryanarto Sarno (ITS, Indonesia)
- ❖ Prof. M. Nasikin (UI, Indonesia)
- ❖ Prof. Udi Subakti C (ITS, Indonesia)
- ❖ Prof. Arif Budiman (UGM, Indonesia)

CONTENT

Class Room A1

No	Paper Title	Presenter	Institution
1	Catalytic Degradation of Glycerol in Subcritical and Supercritical Water Media	Mahfud, Yuyun Yuniati, and Sumarmo	Sepuluh Nopember Institute of Technology Surabaya, Indonesia
2	Effect of Molecular Weight and Contents of Polyethylene Glycol on Crystallization of Polylactic Acid/Talc	Wisaroot Payubnop, Sirijutaratana Covavisaruch, and Nukul Euaphantasate	Chulalongkorn University, Bangkok, Thailand
3	Study on Important Parameters Affecting The Soxhlet Extraction of Lempuyang Oil Production	Nur Hidayah Binti Mohmed Isa, Fethie Binti Ahmad Zakil, and Izirwan Bin Izhah	Universiti Malaysia, Pahang, Malaysia
4	Synthesis of MCM-48 Mesoporous Materials From The Dieng Wonosobo Geothermal Sludge	Maria Christina Prihatiningsih, Imam Prasetyo, Rochmadi, and Wiratni	Gajahmada University, Yogyakarta, Indonesia
5	Optimization of Epoxidation Reaction of Palm Oil Methyl Ester Using Response Surface Methodology	Edy Purwanto, Emma Savitri, Dimas Febrian Saputra, and Didik Setianto	University of Surabaya, Surabaya, Indonesia
6	A Study on The Kinetics Parameters for A Continuous Flow Activated Sludge Process in Wastewater of Textiles	Judy R Witono, Adrian, and Fenny Yoswara	Parahyangan Catholic University, Bandung, Indonesia
7	Numerical Prediction of Hydrodynamic effect on Biohydrogen Production in Stirred Tank	Tantular Nurtono, Wa Ode Cakra Nirwana, Arif Widjaja, Nadiem Anwar, and Sugeng Winardi	Sepuluh Nopember Institute of Technology Surabaya, Indonesia
8	The Potential of Phytoremediation Using Duckweed (<i>Lemna minor</i>) for Wastewater Treatment	Tuani Lidiawati S	Surabaya University, Surabaya, Indonesia
9	Production of Sodium Lignosulphonate From Lignin Isolate of Empty Fruit Bunches as Dispersant of Gypsum Paste	Ismiyati	Muhammadiyah University of Jakarta, Jakarta, Indonesia
10	Simulation and Experimental System Terner Aseton-Butanol-Ethanol With Batch Distillation	Ni Ketut Sari	UPN "Veteran" University, Surabaya, Indonesia

Class Room A2

No	Paper Title	Presenter	Institution
1	Potential of Munciple Solid Waste as A Renewable Alternatif Fuel	Edy Wiyono	Gadjah Mada University, Yogyakarta, Indonesia
2	Sustainability of Information and Communication Technology Projects for Rural Development and Empowerment in Developing Countries – Evidence From India (2000-2010)	Siva Prasad Ravi	School of Buisness and Economics Thompson Rivers Univerity, Kamloops, British Columbia, Canada
3	The Analysis and Characterization of <i>Xylocarpus Moluccensis</i> Mangrove Fruit Seeds	Setiyo Gunawan, R. Darmawan, Aliwafa, Miranti Nanda H, Akhmad Dhika S, and Hamzah Fansuri	Sepuluh Nopember Institute of Technology, Surabaya, Indonesia
4	Reaction Kinetics of Magnesium Compound Recovery From Bittern Using Slake Lime Continuousley	Sutiyono, and Pratiwi	UPN "Veteran" University, Surabaya, Indonesia
5	Biohydrogen Production from Cane Molasses by Muttated Enterobacter aerogenes ADH43 in Continous Stirred Tank Reactor System With Varying Dillution Rate and its Application into Fuel Cell for Generating Electricity	Yusnita Liasari, Mahyudin Abdul Rachman, Harijono, and Agustin Krisna Wardana	Surabaya University, Surabaya, Indonesia
6	Bio-Lubricants Development : Reducing Wear Scar Diameters Using Ashless additives	Dicky Darmawan, Dyah setyo Pertiwi, Achmad Siddik and Sayd Rachadiyan Pahlevi	National Institute of Technology (ITENAS) Bandung, Indonesia
7	Hydroctacking Palm Oil on Ni-Mo Catalyst	Erlan Rosyadi, Nyoman Puspa Asri, Santi Diah Savitri, Ignatius Gunadi, and Achmad Roesyadi	Sepuluh Nopember Institute of Technology Surabaya, Indonesia
8	Elimination of Phenol by Adsorption Process Using Natural and Modified Zeolite As Adsorbents	Yunus Fransicus, Andre Oentoro and Lidya Jonatan	Surabaya University, Surabaya, Indonesia
9	The Effect of Methanol Concentration On Production of Methyl Ester Using Palm Oil as Substrate in A Stirred Tank Reactor	Jafri N, Abdullah N, and Mohd Ghazi T I	Universiti Putra Malaysia, Selangor, Malaysia
10	Adsorption of Blue Methylene by Cow Bone Char Activated With Sodium Hydroxide and Coated With Aluminium Oxide	E Suprihatin, I Nengah Simpen, Wahyu Dwijani, and I Made Swarjana	Udayana University, Denpasar, Indonesia



Class Room B1

No	Paper Title	Presenter	Institution
1	Design and Implement Integration System With An Enterprise Service Bus	Indrajani	Bina Nusantara University, Jakarta, Indonesia
2	Social Networking Website As A Communication Media : Study Case Petra Christian University Library	Lily Prisca Dewi, Iwan N Sandjaja, and Leonard C Tali	Petra Christian University, Surabaya, Indonesia
3	Design and Implementation of Payroll Information System in PT. Karya Tama Rimba Cemerlang	Agustus Noertjahyana, Felix Montana, and Arlinah Imam Rahardjo	Petra Christian University, Surabaya, Indonesia
4	Integrating Fast-Lca and MFCC Methods for Voice Recognition With Noise Splitter	Lina, Arlends Chris, and Felicia Ilona	Tarumanagara University, Jakarta, Indonesia
5	Online monitoring System at The Green House Plant Growth Based Mobile Technology	M Syahrul Munir, and I Gede Susrama Masdiyasa	UPN "Veteran" University, Surabaya, Indonesia
6	Weather Sensor Data Acquisition Using Delay Tolerant Networking	Justinus Andjarwirawan, Budi Darmawan, and Andreas Handojo	Petra Christian University, Surabaya, Indonesia
7	Application Program Design Base on Text Data Security by Means of The Base-64 Algorithm and The QR-CODE Image Transformation	Wasino, Tumpal Pandiangan and Putra Kema	Tarumanagara University, Jakarta, Indonesia
8	The Design and Prototyping of Solar Cell Based Mobile Phone Charger	Bagus Arthaya, and Irfan A Nuswantoro	Parahyangan University, Bandung, Indonesia
9	The Design and Development of Administrative Web-Based Information System With COGS Calculation	Ibnu Gunawan, Yulia Kendengis, and Roy Philip Stanley	Petra Christian University, Surabaya, Indonesia
10	An Integrated Modular Design and Life Cycle Design for Manufacturing Industry : A Critical Review	Dira Ernawati, I Nyoman Pujawan, I Made Londen Batan, and Maria Anityasari	UPN "Veteran" University, Surabaya, Indonesia



Class Room B2

No	Paper Title	Presenter	Institution
1	Development of Software for Evaluating Radiograph of Welded Joints Material	Supriyono, Bagus Triatmoyo, and Djoko Marjanto	Polytechnic Institute of Nuclear Energy Agency, Yogyakarta, Indonesia
2	Comparing of demosaicing Algorithm with Constant Hue-based interpolation, Bilinier Interpolation, and Edge-Sensing Interpolation Methods.	Kartika Gunardi, Liliana, Yongnardi, and stephen	Petra Christian University, Surabaya, Indonesia
3	Web Based Register and Vendor Evaluation System for PT. Garuda Indonesia	Jurike V. Moniaga ¹ , Ageng Purnomosidi, Trias Fikriansyah, Wahyudi	Bina Nusantara University, Jakarta, Indonesia
4	Alignment Measurement of SOA Benefits in ERP Implementation using Partial Least Square	Abdul Rozaq ¹ , Riyanarto Sarno ²	State Polytechnic of Banjarmasin, Banjarmasin, Indonesia
5	Remote Monitoring of Soil Quality by Using IDAS (Internet-Based Data Acquisition System) and SMS Gateway Technology	Basuki Rahmat, Purnomo Edi Sasongko, and Wanti Mindari	UPN "Veteran" University, Surabaya, Indonesia
6	Internet Banking : The Roles and Responsibilities to Safety Risks of Customer Funds	Budi Nugroho	UPN "Veteran" University, Surabaya, Indonesia
7	Content Based Image Retrieval Using Rotated Wavalet Transform and Canberra Distance	Ricky Eka Putra ¹ , Nanik Suciati ² , Arya Yudhi Wijaya	Informatics Department, Faculty of Information Technology, Institut Teknologi Adhi Tama Surabaya ¹
8	Designing and Developing Camelot Restaurant Information System in Ordering With Web Based Mobile Device	Alexander Setiawan, Justinus Andjarwirawan, and Andrew Brian	Petra Christian University, Surabaya, Indonesia
9	Calculate Similarity of Document Using Word Count and Cosine Similarity	Wahyu S.J Saputra,	UPN "Veteran" University, Surabaya, Indonesia



Class Room C1

No	Paper Title	Presenter	Institution
1	Global Requirements of Chitosan for Medical and Food Applications	Natalia Susenc, Emma Savitri, and Claudia Windasari	Surabaya University, Surabaya, Indonesia
2	Effect of Chitosan to The Quality of Pharmaceutical Waste Product	Henny Rachdiati, Padmono Citroreksoko, and Syamsul Anwar	Universiti Kuala Lumpur, Malaysia
3	Purification of Recombinant Cyclodextrin Glucanotransferase (CGTase) Using Mixed-Mode Adsorption Chromatography	Margaret Sivapragasam, Raha Abdul Rahim, and Norhafizah Abdullah	Universiti Putra Malaysia, Serdang, Malaysia
4	Kombucha Tea As A Potensial Inhibitor of Free Radical	Suyono, Leny Yuanita	State University of Surabaya, Surabaya, Indonesia
5	Optimiation of The Extraction's Condition of Eugenia Polyanta (Wight)Walp.) Leaves Powder Predried With Instantaneous Controlled Pressure-Drop ((DIC)(1,9 bar; 10,86 sec.)) and of The DIC's Cycles	Indrajati Kohar, Soediatmoko Soediman, Karim Allaf, and Niken Ariestanti	University of Surabaya, Surabaya, Indonesia
6	Struture-Based Approaches for New Antimalarial Drug Design	Lim Kok Keong, Chan Kit Lam, and Habibah A Wahab	University Science Malaysia, Pulau Pinang, Malaysia
7	Formulation and Physicochemical Stability of 20% Glycolic Acid Creams Using Sepigel *305 and Combination of Sepigel *305-Montanov	Ni Luh Dewi Aryani, Nani Parfati, Rica Marlia Swandayani and Angelina Haliem	Surabaya University, Surabaya, Indonesia
8	Primers pncAF and pncAR Amplified The pncA Gene of MDR <i>Mycobacterium Tuberculosis</i> Isolate R7 Related to Pyrazinamide Resistance	Rahmaniar Mulyani, and Achmad Saifuddin Noer	Achmad Yani University, Bandung, Indonesia
9	Effectiveness of 2,4 Diklorobenzoiltiourea As Anticonvulsant With Electroshock Method in Mice	Aguslina Kirtishanti, Dini Kesuma, and Widya L.C	Surabaya University, Surabaya, Indonesia
10	Struture-Based Virtual Screening of Malaysia Natural Product Toward Discovery of Potent Ppar Agonist	Lee Guan Sheng, Tengku Sifzizul Tengku Muhammad and Habibah A Wahab	University Science Malaysia, Pulau Pinang, Malaysia
11	Design of Monitor Tools For CO2 Gas on Medical Anesthesia Machine	Anwar Budianto, Toto Trikasjono, and Anggiat Winner OS	Polytechnic Institute of Nuclear Technology-BATAN
12	Potential Neuraminidase Influenza A (H5N1 and H1N1) Inhibitor of Brucea Javanica (L.) Merr	Neny Purwitasari, Noernisah Muhamed, Hibibah A Wahab, and Nurkusairi Khairul Ikram	Universiti Sains Malaysia, Penang, Malaysia

Class Room A3

No	Paper Title	Presenter	Institution
1	Effect of Metal Dopants (Al, In, Mn) On The Characteristics of ZnO Fine Particles Prepared by Spray Pyrolysis Method	Widyastuti, Adhi Setiawan, Kusdianto, Tantular Nurtono, Suci Madhania, Sugeng Winardi	Sepuluh Nopember Institute of Technology, Surabaya, Indonesia
2	Evaluation of Butanol-Water Distillation Column With Heat Integration to Obtain a Minimum Total Annual Cost (TAC)	Satrio Pamungkas, Tri Hartanto, Musfil Ahmad Syukur, and Renanto Handogo	Sepuluh Nopember Institute of Technology, Surabaya, Indonesia
3	Mechanism and Reaction Kinetics of Peat Decomposition	Edi Mulyadi and Nurul Wiji Triana	UPN "Veteran" University, Surabaya, Indonesia
4	Biodegradation of Organic Material from Produce Water Using Consortium Microorganism With Step Aeration Processing	Rudy Laksmono W, Tuju Agung Rachmanto, Edison Effendy, and Q Helmi	UPN "Veteran" University, Surabaya, Indonesia
5	Exploiting From Industry Bioethanol	Ni Ketut Sari, Komang Yudhi Dharmawan, and Gitawati	UPN "Veteran" University, Surabaya, Indonesia
6	Computational Fluid Dynamic (CFD) Study of Aerosol Separation in Electrostatic Precipitator	Tantular Nurtono, Widyastuti, Suci Madhania, and Sugeng Winardi	Sepuluh Nopember Institute of Technology, Surabaya, Indonesia
7	Mechanical Properties and Biological Degradation of Injection Molded Poly (vinyl alcohol)-Cassava Starching	Nor Sarizal Nor Hassan, Wan Aizan Wan Abdul Rahman	Universiti Teknologi Malaysia, Johor, Malaysia
8	Thermal and Rheological Properties of Polypropylene/Carbon Nanotubes Nanocomposite	Katabongkot Phetsang, Sirijutaratana Covavisaruch ¹ and Nawadon Petchwattana ²	Chulalongkorn University, Payathai Road, Patumwan, Bangkok
9	PP/RS Biocomposite Foam : Effect of Different Compatibilizer Loading	Nazuha Binti Tugiman, Zurina Binti Mohamad ² , and Wan Aizan Wan Abdul Rahman ³	Universiti Teknologi Malaysia, 81310 Skudai, Johor, Malaysia

Class Room A4

No	Paper Title	Presenter	Institution
1	Preparation Oz ZTA Doped With Copper Oxide (II) by Colloidal Filtration Methode and Using Tiron As A Stabilizing Agent	H Wakily and H Metselaar	University Of Malaya, Kuala Lumpur, Malaysia
2	Influences of Xylanase Enzym in Bleaching Pulp Result of Delignification The Rind of Cocoa	Susilowati, Nurul Faizah and Ni Made	UPN "Veteran" University, Surabaya, Indonesia
3	Recovery of Oleic Acid Ethyl Ester Compound After Solid Phase Extraction Purification	Ni Made Suaniti	Udayana University, Denpasar, Indonesia
4	Influences of Nano Scaled Nucleating Agent On The Mechanical Properties of Polypropylene	Panjapong Sripanya, Sirijutaratana Covavisaruchi and Nawadon Petchwattana	Srinakharinwirot University, Bangkok, Thailand
5	Transesterification of Palm Oil to Methyl Ester Using γ -Alumina Supported Base Catalyst	Nyoman Puspa Asri, Erlan Rosyadi, Ferdy Hartanto, Rachmad Ramadhan, Santi Dyah Savitri, Ignatius Gunedi, Suprpto, Kusno Budikarjono and Achmad Roesyadi	Sepuluh Nopember Institute of Technology, Surabaya, Indonesia
6	Degradation of Remazol Brilliant Blue Using Ozone in A Pipe Flow Reactor	Noor Anis Kunderi, Kartini Megasari, Dadit Eko Setyawan, Kris Tri Basuki, and Maria Christina Prihatiningsih	Polytechnic Institute of Nuclear Technology (POINT), Yogyakarta, Indonesia
7	The Effect of Precursor Concentration To ZnO-Silica Nanocomposite Formation Using Sol-Gel Method	Sugeng Winardi, Widyastuti, Kusdianto, Tantular Nurtono, and Suci Madhania	Sepuluh Nopember Institute of Technology, Surabaya, Indonesia
8	Binding Of Bile Acids by Functional Groups of Yard - Long Bear: Dietary Fiber on Total Cholesterol Decrease	Leny Yuanita, Tjandra kirana, Suyono.	Department of chemistry, State University of Surabaya
9	Waste Oil Purification With Ultrafiltration Membrane	Sri Redjeki	UPN "Veteran" University, Surabaya, Indonesia
10	Determination of Toxicity of Tofu Wastewater to Nila Fish (<i>Oreochromis Niloticus</i>)	Naniek Ratni JAR and Anas Zubair	UPN "Veteran" University, Surabaya, Indonesia

Class Room B3

No	Paper Title	Presenter	Institution
1	Information Retrieval With Latent Semantic Indexing Method	Wasino, and Leonardo Sukianto	Tarumanagara University, Jakarta, Indonesia
2	Optimization of Line Masking Intelligent Traffic System (Case Study in The Surabaya City)	I Gede Susrama Masdiyasa, and Ariyono Setiawan	UPN "Veteran" University, Surabaya, Indonesia
3	A Weighted Ontology Matching for COBIT Maturity Measurement Model (WOMCM3)	Rahimi Fitri, and Riyanarto Sarno	State Polytechnic of Banjarmasin, Banjarmasin, Indonesia
4	Voting of Biclass and Multiclass Artificial Neural Network	Fety Tri Anggraeny, Indriati, and Heliza Rahmania Hatta	UPN "Veteran" University, Surabaya, Indonesia
5	Construct of Thyroid Uptake Instrument Using Microcontroller: AT 89S8253 With USB Interface	Nugroho Trisanyoto, Agustin Nurcahyani, and Adi Abimanyu	Polytechnic Institute of Nuclear Technology, Yogyakarta, Indonesia
6	Circular Construction of Iris Feature Vectors For Iris Recognition System	Lina, Danu Widatama, Tony Mulia, and Benyamin Kusumoputro	Tarumanagara University, Jakarta, Indonesia
7	Latent Semantic Indexing and Introspective Sort Methods to Smooth Google Translate Translation Results	Rizky Parlika	UPN "Veteran" University, Surabaya, Indonesia
8	Neuro-Fuzzy-Based Real Time Flood Disaster Early Warning System	Basuki Rahmat, Mohamad Irwan Afandi, and Rizky Parlika	UPN "Veteran" University, Surabaya, Indonesia
9	Increasing The Quality of Transportation Service Using Serqual Method and Analytical Hierarchy Process in PT. Tugu Jogja Trans	C.Indri Parwati	Istitute of Science & Technology Akprind, Yogyakarta, Indonesia



Class Room B4

No	Paper Title	Presenter	Institution
1	Development of Google Chrome Extension For Web Vulnerability Scanner	Achmad Junaidi, Basuki Rahmat, and Aditya Wardana	UPN "Veteran" University, Surabaya, Indonesia
2	Differential Evolution Optimization for Bezier Curva Approximation With Centripetal Parameterization	Priza Pandunata	UPN "Veteran" University, Surabaya, Indonesia
3	Feedback Fuzzy Control Design of Power System Stabilizer (PSS) for Single Machine Infinite Bus (SMIB)	Tarnaji, and Imam Robandi	Sepuluh Nopember Institute of Technology Surabaya, Indonesia
4	Expert System Mobile for Identification Pest for Manggo	Asti Dwi Irfianti	UPN "Veteran" University, Surabaya, Indonesia
5	Ontology-Based Information Technology Skills Management	Doddy Ridwandono, and Bayu Utomo	UPN "Veteran" University, Surabaya, Indonesia
6	Implementation of Executive Information System Motor Cycle Sales in PT.X	Syurfah Ayu Ithriah, and Nurcahyo Wibowo	UPN "Veteran" University, Surabaya, Indonesia
7	Application Control Robot Using Remote TV Sony	Tri Puji Rahayu, Yakub, and Candika Sindoro	STMIK Dharma Putra, Tangerang, Indonesia

Class Room C2

No	Paper Title	Presenter	Institution
1	Developing A New Natural Food Additive : A Study of Dragon Fruit in Malaysia	Seyedeh Khadijeh Taghizadeh, Fatemeh Shahhosseini, Amin Maghsoudi, Shaghayegh Malekifar, Nazli Moshfeghi, and Omid Mahdavi	University Of Malaya, Kuala Lumpur, Malaysia
2	Effect of Agglomeration Process on The Physical Properties of The Coconut Milk Powder	Alwani Hamad, and Manop Suphantharika	Muhammadiyah Univerity of Purwokerto, Purwokerto, Indonesia
3	Rice Bran Oil Production by Fermentation Using The Yeast	Dwi Suhartanti, and Endang Sulistiawati	Ahmad Dahlan University, Yogyakarta, Indonesia
4	Antibacterial Activity of Aromatherapy Essential Oils of Eucalyptus (<i>Eucalyptus globules</i>), Mint (<i>Mentha piperita</i>), and Bergamot (<i>Citrus bergamia</i>)	Insan Sunan K, Dewi Rusmiati, and Yeza Anadra	Padjadjaran University, Bandung, Indonesia
5	Tempe Increases Total Antioxidant Capacity (TAC) and Reduce Malondialdehyd (MDA) in Rats Irradiated With Ultraviolet Ray	Siti Maryam	Ganesha University of Education, Singaraja, Indonesia
6	The DNA Isolation of Menoreh Kuning Durian (<i>Durio Zibethinus Murr</i>) Cultivar Using Detergent and Commercial Kit	Tara Puri Ducha Rahmani and Budi S Daryono	Gajahmada University, Yogyakarta, Indonesia
7	Influenza A Viruses in Malaysia	Ten Ban Hong, and Habibah A Wahab	University Science Malaysia, Pulau Pinang, Malaysia
8	Antibacterial Activities Test of Leaf Senggani Infusa On Shigella Flexneri	Dwi Suhartanti, Trianik Widyaningrum, and Ratnawati	Ahmad Dahlan University, Yogyakarta, Indonesia
9	Mutation Analysis of Mitochondrial DNA Fragmen D-Loop in Human Mesodem Layer	Unwakoly S, Noer S	Pattimura University Ambon
10	Hydrodynamic Study of Membrane Bioreactor Subrnerged for Wastewater Treatment Process	Aisyah Endah Palupi	Surabaya State University, Surabaya, Indonesia
11	Sdc Fabrication As Cathode Materials In Solid Oxide Fuel Cell (Sofc)	Abraham. Mariwy ¹ , Bambang , Prijamboedi ² , And Ismunandar ²	1.Chemistryeducation Study Program, Faculty Of Education And Teacher Training Pattimura University, Ambon Indonesia 2.Inorganic Chemistry Division, Faculty Of Mathematics And Natural Science Bandung Institute Of

			Technology, Bandung Indonesia
12	The Schlieren Effect In Iodine Analysis By Used Spectrophotometry Method Based Flow Injection Analysis	Yeanchon H. Dulanlebit ¹ and M. Bachri Amran ²	¹ Chemistry Study Program, Faculty of Teacher and Education Sciences Pattimura University – Ambon ¹ ² Chemistry Department, Faculty of Mathematics and Natural Sciences Institut Teknologi Bandung ²

Class Room D

No	Paper Title	Presenter	Institution
1	Adsorption of Pb in Electroplating Waste Water By Moringa Seeds Powder	Caecilia Pujiastuti, Erwan Adi Saputro	Chemical Engineering Department, UPN "Veteran" Jawa Timur, Surabaya, Indonesia.
2	Effectiveness of soy sauce fractions using coconut sugar and sucrose as an antioxidant	Dedin F. Rosida, Wijaya CH, Apriyantono A and Zakaria FR	Departemen of Food Technology, UPN "Veteran" Jawa Timur Departemen of Science and Food Technology, IPB
3	Waste Utilization Of Jackfruit As Materials For Making Alcohol	Dwi Hery A.	Chemical Engineering Department, UPN "Veteran" Jawa Timur, Surabaya, Indonesia.
4	Utilization Of Solid Waste In Making Palm Shell Fertilizer Liquid Potassium Sulphate	Ely Kurniati	Department of Chemical Engineering, Faculty of Industrial Technology, UPN "Veteran" East Java, Surabaya, Indonesia
5	Application Of Lean Thinking Concept Analysis To Reduce The Level Waste (Waste) On The Bottle Glass Products Polos "Medium Weight" In The Production Floor PT. Iglas Gresik	Endang P.W.	Industrial Engineering Department, Faculty of Industrial Technology, UPN "Veteran" Jawa Timur, Surabaya, Indonesia.
6	Process Measurement Capabilities Making The Instant Noodles in PT. Heinz Suprama Sidoarjo	Enny Ariyani	Industrial Engineering Department, Faculty of Industrial Technology, UPN "Veteran" Jawa Timur, Surabaya, Indonesia.
7	Indonesian Text Conversion Application To Japanese (Hiragana And Katakana) And Using Prosody Mbrola Synthesizer	Kartini, Ferry S.A	Department of Informatics Engineering, Faculty of Industrial Technology, UPN "Veteran" Jawa Timur, Indonesia
8	Study Kinetics of The Enzyme Urease From Soybeans	Lilis Siti Aisyah ¹ , Rahmaniar Mulyani ¹ , Harliansyah ² , Agung Sadeli ²	¹ Faculty of Mathematics and Natural Sciences, UNJANI, Cimahi ² Faculty of Medicine University Yarsi, Jakarta Pusat
9	Making of Ethanol From Rice Straw	Lucky Indrati Utami	Chemical Engineering Department, Faculty of Industrial Technology, UPN "Veteran" Jawa Timur, Surabaya, Indonesia.
10	Making Ethanol From Tapioca Starch Liquid Waste By Hydrolysis And Fermentation	Luluk Edahwati	Chemical Engineering Department, Faculty of Industrial Technology, UPN "Veteran" Jawa Timur,

21	Production of Amorphous Silica From Geothermal Sludge of Dieng Indonesia	Srie Muljani ¹ , HeruSetyawan ² , KetutSumada	¹ Chemical Engineering Department, Faculty of Industrial Technology, UPN "Veteran" JawaTimur, Surabaya, Indonesia
22	Manufacturing of Edible Film From Kimpul (<i>XanthosomaSagittifolium</i> Schott) Starch	SudaryatiHp, Tri Mulyani, FitrianaFebriningrum	Departementof Food Technology, Faculty of Industrial Technology, UPN "Veteran" JawaTimur, Surabaya, Indonesia.
23	Removal of Seawater Hardness Contain Ca ²⁺ Ion Using Natural Zeolite As Adsorbtion	Suprihatin	Chemical Engineering Departement, Faculty of Industrial Technology, Upn "Veteran" East Java
24	The Effect of Sodium Alginate And Coconut Oil Addition to Cowpea's Milk Parevine Quality	Titi Susilowati, Enny Karti, B And Rizki Indah Pravianti	UPN "Veteran" JawaTimur, Surabaya, Indonesia.
25	Study OnThe Use ofActivated CarbonAnd Zeolite As Adsorbent In Purification Process ofKapok Seeds CrudeOil	TjatoerWelasih, Nurhapsari	Chemical Engineering Department, Faculty of Industrial Technology, UPN "Veteran" JawaTimur, Surabaya, Indonesia.
26	Beneficial of Yam Tuber (<i>Pachyrrhizuserosus</i>) As Synbiotik Drink	Tri Mulyani, Sudayati, AgusSusanto.	Departementof Food Technology, Faculty of Industrial Technology, UPN "Veteran" JawaTimur, Surabaya, Indonesia.
27	PerformanceAnalysis SupplyChainOperationReference(Scor) InPT. BayerIndonesia-Bayer CropscienceSuabaya	Tri Susilo	Industrial Engineering Department, Faculty of Industrial Technology, UPN"Veteran" Jawa Timur, Surabaya, Indonesia
28	Effect of Frying Temperature On Sweet Potato To The Formation Of Acrylamide Using High Performance Liquid Chromatographi (HPLC) Method	Yusi Fudiesta	University of General AchmadYani (UNJANI)
29	Production Capacity Planning Method With Rough Cut Planning Capacity (RCCP)	YustinaNgatilah	Industrial Engineering, UPN "Veteran" JawaTimur, Surabaya, Indonesia.
30	Kinetic Reaction of Cyanide Degradation by Using Hydrogen Peroxide	Isni Utami	Chemical Engineering Department of UPN 'Veteran' Jawa Timur



31	Planning And Scheduling Activities Of Fishery Products Distribution Requirement Planning (Drp)	Sumiati	Industrial Engineering, UPN "Veteran" Jawa Timur, Surabaya, Indonesia.
32	Reaction Kinetics of Oxalic Acid Production From Palm Fiber With H ₂ O ₂	Retno Dewati, Erwan Adi Saputra, Nurul Novita	Chemical Engineering Department, UPN "Veteran" Jawa Timur, Surabaya, Indonesia.
33	Information System Strategic Planning at PuSDeHAM (Center for Study of Democracy and Human Right) Surabaya	Mohamad Irwan Afandi, Ajeng Putri Abdini	Information System Department, UPN "Veteran" Jawa Timur, Surabaya, Indonesia.
34	Promising lines of investigation for theorists of urban and regional development	Niniek Anggriani	Environmental Engineering Department, UPN "Veteran" Jawa Timur, Surabaya, Indonesia,

FORMULATION AND PHYSICOCHEMICAL STABILITY OF 20% GLYCOLIC ACID CREAMS USING POLYACRYLAMIDE, C13-14 ISOPARAFFIN, LAURETH-7 AND COMBINATION OF POLYACRYLAMIDE, C13-14 ISOPARAFFIN, LAURETH7 WITH A GLUKOLIPID OF VEGETABLE ORIGIN

Ni Luh Dewi Aryani, Nani Parfati, Rica Marlia Swandayani, dan Angelina Haliem
Faculty of Pharmacy, Surabaya University
Surabaya, Jawa Timur Indonesia
Email: dewi_aryani@ubaya.ac.id

Abstract

Glycolic acid is a α -hydroxy acids (AHAs). It are used in skin lightening creams. It were developed formulation of 20% glycolic acid creams. The creams were made using 4% of polyacrylamide, C13-14 isoparaffin, laureth-7 as a thickening agent for cream gels and emulsions base and combination of 1.5% of polyacrylamide, C13-14 isoparaffin, laureth-7 and 5% of a glukolipid of vegetable origin as emulsifier agent. Then the physicochemical stabilities were tested using climatic chamber for 30 days at 40°C with 75% Relative Humidity (RH). The parameters stability observed were organoleptic, droplet size, density, viscosity, emulsion type, phase separation, pH and concentration of acid glikolat. Organoleptis, droplet size, density, viscosity, type of emulsion and phase separation of all of creams were stable, but the pH decreased during the storage time. The time of the concentration of glycolic acid remaining to 90% in cream using using 4% of polyacrylamide, C13-14 isoparaffin, laureth-7 and using combination of using 4% of polyacrylamide, C13-14 isoparaffin, laureth-7 with 5% of a glukolipid of vegetable origin were 30 and 32 days respectively.

Keywords: glycolic acid, cream, physicochemical stability

1. INTRODUCTION

Healthy skin is skin that enough moisture and oil production with no damage or skin disease. Environmental, hormones, age, diet and the presence of hereditary factors can make the skin does not always healthy. It can be seen on the skin of the face and on the skin of another. There are many kinds of facial treatments to remove dead skin cells in the skin layer. The dead skin cells need to be removed, because it is potential to cause wrinkles, fine lines or spots on the face. The dead skin can be remove by chemical peeling treatment (Wasitaatmadja, 1997).

The materials used for chemical peeling is Alpha Hydroxy Acid (AHA). Alpha Hydroxy Acid (AHA) has other advantages compared with other active ingredients. It can increase collagen content in order to rejuvenate and moisturize the skin. One of AHAs that is used for cosmetics is glycolic acid. This ingredient works by slough off the outer skin cells. After peeling, the outermost skin cells be replaced by new skin cells naturally. The result is that the skin more fresh and looks brighter (Pollick,2003)

AHA product in the market has a concentration of about 10% or be less than 10%. Concentration on the beauty clinic is between 20-30%,

and the supervision of physicians is between 40-70% (FDA, 1998).The products should be stable at the time periode which is determined (Mitsui, 1996), as well as cosmetic products. Because stability is one of the requirement for the pharmaceutical products beside of safe, effective and acceptable (USP XXVIII, 2005). Stability of the products is include chemical, physical, microbiological , pharmacological and toxicological stability (USP XXVIII, 2005).

There are two ways of testing the stability, ie stability testing at room temperature (long-term testing) and an accelerated stability testing (accelerated testing) (Agoes, 2001). Method of stability testing at room temperature takes a long time (about 1 year or more) (Martin, 1993). The stability test is used to obtain information about the stability of pharmaceutical products in order to determine shelf-life and period of use in certain packaging and storage conditions.

In this study, the physicochemical stability of the creams were tested by the of accelerated stability testing method using a climatic chamber to maintain temperature and humidity remain. The creams contained of 20% of glycolic acid using 4% of polyacrylamide, C13-14 isoparaffin, laureth-7 as thickening agent for cream gels and emulsions base and combination of 1.5% of polyacrylamide, C13-14

isoparaffin, laureth-7 with 5% of a glukolipid of vegetable origin as emulsifier agent. The accelerated testing was observed by using a climatic chamber at 40° C and 75% in relative humidity (RH) within 30 days. The stability parameters were organoleptics (shape, odor, color), density, viscosity and flow properties, phase separation, droplet size emulsion type, pH, and concentration of glycolic acid.

2. METHODOLOGY

2.1. CREAM FORMULATION

The creams containing glycolic acid using polyacrylamide, C13-14 isoparaffin, laureth-7 (Formula I) and the combination of polyacrylamide, C13-14 isoparaffin, laureth-7 with a glukolipid of vegetable (Formula II) as follows:

<u>Materials</u>	Formula I (%)	Formula II (%)
<u>Paraffin liquid</u>	10	10
<u>Glyceryl stearate</u>	4,5	4,5
<u>Stearic acid</u>	1,5	1,5
Glycerin	4	4
Na metabisulfite	0,5	0,5
Methyl paraben	0,15	0,15
Propyl paraben	0,15	0,15
Propilenglikol	7	7
Glycolic acid 70%	28,55	28,55
Polyacrylamide, C13-14 isoparaffin, laureth-7	4	1,5
A Glukolipid of Vegetable Origin	-	5
demineralized water until	100	100

The creams were made as follows:

The glycolic acid cream using Sepigel * 305 (Formula I) as follows: stearic acid, glyceryl monostearate and liquid paraffin are melted in a porcelain dish at temperature of 70 ° C. Then it poured into a hot mortar containing Polyacrylamide, C13-14 isoparaffin, laureth-7 and stir until it forms a base of cream and homogen. Glycerin added to the base cream that has formed little by little, stirring until homogen. Sodium metabisulfite dissolved in 3 ml demineralized water until dissolved and then added to the cream and glycerin bases mixture, stirring until homogen. Propyl and methyl parabens were dissolved in propylene

glycol and glycolic acid was added. Then it were stirred until homogeneous and then added to the a mixture of cream base stirring until homogen. The remaining water were added after adding the oil phase gradually, stirring until homogen. The cream was stored in tightly sealed containers and protected against the light.

The glycolic acid cream that uses a combination of Polyacrylamide, C13-14 isoparaffin, laureth-7 with a glukolipid of vegetable origin (Formula II) were made as follows: stearic acid, glyceryl monostearate, a glukolipid of vegetable origin and liquid paraffin are melted in a porcelain dish at a temperature of 70 ° C. Then it were poured into a hot mortar containing Polyacrylamide, C13-14 isoparaffin, laureth-7 and stirred until it forms a base of cream and homogeneous. The later stages were the same as Formula I.

2.2 STABILITY TEST

The creams were inserted into the climatic chamber that has been made at 40 ° C 1° C in temperatures and 75% in relative humidity for 30 days. and then the stability of the physicochemical properties of the creams were tested. The organoleptics were tested by using visual, the flow properties and viscosities were tested by using Cone and plate viscometer series AT 71 362 (Brookfield), the droplet size were tested by using optical microscope, the type of emulsions were tested by using photo microscope (Zeiss Axioskop). The density were tested by using picnometer and analytical balance (sartorius). The pH were tested by using pH meter (CyberScan type 510), and the concentration of glycolic acid contained in the cream was determined using acid-base titration method.

3. RESULTS AND DISCUSSION

Organoleptics of the creams Formula I and Formula II over the 30 days did not showed the changes of the shape, odor and color. The cream is an odorless and white cream. The creams did not show separated phase for 30 days also.



Figure 1. Form of 20% glycolic acid cream Formula I



Figure 2. Form of 20% glycolic acid cream Formula II

The droplet size of the cream from day 0 to day 30 can be seen in table 1. It were showed that the droplet size of formula I and formula II from day 0 to day 30 were not significantly different, but the droplet size between Formula I and Formula II significantly different

Table 1. Droplet size of 20% glycolic acid cream

Time (days)	Formula I	Formula II
	$d_{v,3} = \frac{\sum n \cdot d^3}{\sum n \cdot d^2}$ (µm)	$d_{v,3} = \frac{\sum n \cdot d^3}{\sum n \cdot d^2}$ (µm)
0	7,3357	24,3508
5	10,8530	30,9727
10	7,8405	26,7567
15	9,6566	31,7256
20	6,0107	24,3329
25	11,4420	30,8944
30	7,8290	25,7289

The density of the cream from day 0 to day 30 can be seen in table 2. It were showed that the density of formula I and formula II from day 0 to day 30 were not significantly different, but the density between Formula I and Formula II significantly different.

The viscosity of the creams from 0 to 30 days were tested by using a Brookfield Cone and Plate viscometer AT series 71 362, with spindle CPE 41, and at a speed of 0.5 rpm can be seen in table 3. It were showed that the viscosity of formula I and formula II from day 0 to day 30 were not significantly different, but the viscosity between Formula I and Formula II significantly different

Table 2. Density of 20% glycolic acid creams

Time (days)	Formula I (g/ml)	Formula II (g/ml)
0	1,0958	1,0509
5	1,1254	0,6384
10	1,0316	1,0466
15	1,1039	1,0087
20	2,1456	1,6470
25	1,4044	1,4121
30	2,1334	1,4476

Table 3. The Viscosity of the 20% glycolic acid creams

Time (days)	Formula I (cps)	Formula II (cps)
0	25750	10965,7
5	25240	24080
10	29616,67	20380
15	24163,33	21516,7
20	21829	24270
25	24000	21313,3
30	23606,67	22573,3

Based on observation, flow properties of both types of preparations are pseudoplastis, the higher of the rate of shear (rpm), the lower the viscosity, as see as figure 3 and 4. Because of the addition of rate of shear, the molecules that had been irregularly arrange themselves to form a straight line so that the barriers to flow into the smaller (Martin, 1993).

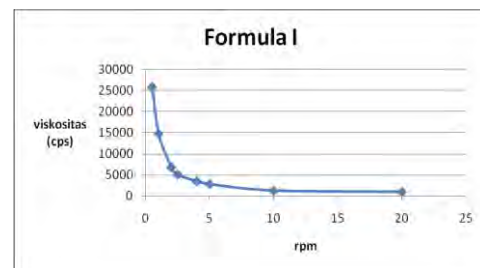


Figure 3. The flow properties of the 20% glycolic acid creams formula I

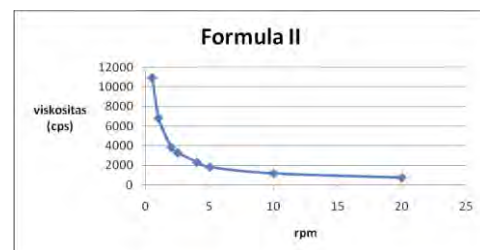


Figure 4. The flow properties of the 20% glycolic acid creams formula II

The emulsion type of cream were tested by using dye of methylen blue. It were showed that the emulsion type of formula I and II were oil in water emulsion (O/W emulsion) as seen as in figure 5 and 6.



Figure 5. The o/w emulsion type of cream formula I

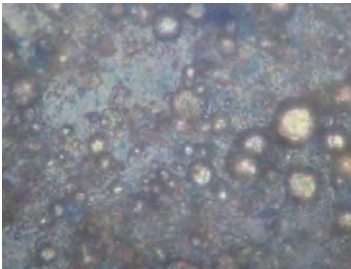


Figure 6. The o/w emulsion type of cream formula II

The pH of the cream from 0 up to 35 days using a pH-meter CyberScan 510 can be seen in table 4. and. The pH of the creams decreased at the storage time periode. The pH between Formula I and Formula II are significant differences.

Table 4. The pH of the creams

Time (days)	pH Formula I	pH Formula II
0	2,53	2,34
5	2,45	2,32
10	2,42	2,27
15	2,41	2,22
20	2,40	2,21
25	2,38	2,20
30	2,38	2,19
35	2,38	2,13

The results of determination of concentration of glycolic acid in the creams for Formula I and Formula can be seen in Table 5.

Table 5. Concentrtion of glycolic acid (Ct) for 15 to 35 days

Time(days)	Formula I Concentration (%)	Formula II Concentration (%)
15	98,94	96,25
20	96,57	94,42
25	95,18	92,34
30	93,53	91,59
35	92,03	90,23

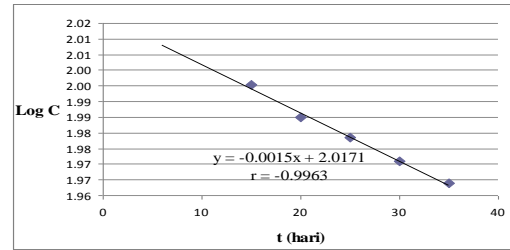


Figure 7. Log Concentrtion of glycolic acid (Ct) for 15 to 35 days (Formula I)

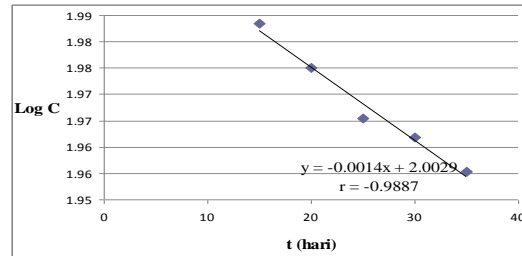


Figure 8. Log Concentrtion of glycolic acid (Ct) for 15 to 35 days (Formula II)

From the regression calculation time versus log concentration remaining of glicolic acid in the formula I and II showed that stated that concentration of glycolic acid has a linear correlation with respect to time. From the above equation is obtained that the constant rate reaction of formula I and II were $k = 0.0035 \text{ day}^{-1}$ and $k = 0.0032 \text{ day}^{-1}$ respectively. The half life of of formula I and II were 198 days and 216 days respectively. The time of the concentration of glycolic acid remaining to 90% formula I and II were 30 and 32 days respectively.

4. CONCLUSION

The Organoleptis, droplet size, density, viscosity, flow propeties, type of emulsion and phase separation of all of the creams were stable, but the pH decreased for 30 days of storage time. The time of concentration of Glycolic acid remaining to 90% in cream using polyacrylamide, C13-14 isoparaffin, laureth-7 and combination of polyacrylamide, C13-14 isoparaffin, laureth-7 with a glukolipid of vegetable origin were 30 and 32 days respectively.

5. REFERENCE

- Agoes, G., 2001, *Uji Stabilitas Obat dan Sediaan Farmasi*, Unit Bidang Ilmu Teknologi Farmasi Institut, Bandung,
- Committee of Revision, 2005, *United States Pharmacopoeia XXVIII*, United States Pharmacopoeia Convention, Inc, Washington, D.C.
- Martin A, Swarbrick J, Cammarata A, 1993, *Physical Pharmacy*, 4th, Williams & Wilkins, London Warsitaatmadja,
- Syarif M. 1997. *Penuntun Ilmu Kosmetik Medik*, Universitas Indonesia, Jakarta.
- Mitsui, Takeo, 1993, *New Cosmetic Science*, Elsevier Science B.V, Amsterdam,
- Pollick M, Harmon J, Smith S.E., 2003-2009, *What is a Glycolic Acid*, (online), (<http://wisegek.com/glycolic> acid Diakses tanggal 12 Januari 2009).
- U.S. Food and drug Administration, 1998, *Alpha Hydroxy Acid for Skin Care*, FDA Costumer, (http://www/fda.gov/fdac/features/1998/298_ahas.html Diakses tanggal 05 Mei 2008).