

Indexed by
PROCEDIA
CPI Reference
procedia.org

4TH

4th International Conference on Nanotechnology, Nanoscience & Advanced Materials (ICNNAM)
4th International Conference on Chemistry, Chemical & Petrochemical Engineering (ICCCPE)
4th International Conference on Material, Industrial & Mechanical Engineering (ICMIME)
4th International Conference on Advances in Civil, Architecture and Environmental Engineering (ICAAEE)
4th International Conference on Economics, Management, Social Sciences, Arts and Humanities (ICEMSAH)
4th International Conference on Artificial Intelligence, Computer, Electrical and Electronics Engineering (ICACEEE)

WWW.ICONTES.ORG
contact@iconetes.org
Tell : +60 17 594 8317

ICONTES

4TH INTERNATIONAL CONGRESS ON
TECHNOLOGY - ENGINEERING & SCIENCE
AUG 05-06, 2017, KUALA LUMPUR - MALAYSIA

Deadline : 10th Jun 2017



Jalan Kerinchi, Kampung Kerinchi, 59200 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur, Malaysia

<u>Title</u>	<u>Page</u>
Effect of Electrolyte Composition on Electrode Reactions of Iron at Potentials of Its Active Dissolution.....	1
Deep Learning and Its Applications in Engineering Applications	8
Synergetic Power Optimization Control of Photovoltaic Systems.....	9
A Very High Efficiency and High Gain Two Stacked Cylindrical Dielectric Resonator Antenna (Sc CDRA) for Anti-Collision Long Range Radar (IRR) Application.....	10
Hybrid Elitist-ant System for Nurse-rostering Problem.....	16
An Elite Pool-based Big Bang-big Crunch Metaheuristic for Data Clustering.....	17
Deep Convolutional-Based Medical Retrieval System Using Radon Transformation	18
Voice Recognition Controlled Smart Home System Using Amazon’s Alexa	19
IVRS Based Healthcare Monitoring System.....	26
Regularization in Deep Structural Networks on Pathology Images	29
Applying Network Centrality Topologies to Explore the Complexity of Interaction in Software Development Project.....	37
Sri Single Seedling Transplanting Implement: Breakthrough to Challenges on Sri Planting and Spacing Techniques	38
Management of Food Shelf Life and Energy Efficiency with Adaptive Food Preservation System (AFPS) Appliance.....	40
A Retrospective Survey of Ruminants Carcass Condemnation in Abattoirs of Gonbad in Golestan Province, Iran (2016-2017)	41
Effect of Nanoencapsulated Form of Zataria Multiflora Boiss. Essential Oil on the Some Microbial Properties of Beef Burger at Refrigerated Temperature.....	42
Soybean and Corn Intercropping on the Different Lime and Husk Ash Dose Under Saturated Soil Culture on Tidal Swamp	43
Effects of Micro-Credit and Human Resource Development (HRD) Activities on Socio-economic Empowerment of Women Through Livestock Production: A Case Study of Akrsp in Northern Areas of Pakistan.....	44

Title	Page
Oxidative Transformation of Organic Functional Groups with Silica Gel Supported Green Ruthenium Catalyst	175
Novel α -Hydroxy[1-(2-ethoxyethyl) Piperidin-4-yl]phosphonate as Candidate for Multi-Purpose Substances	177
Simulation of Carbon Monoxide Poisoning on the Bi-Layered Anode Catalyst Layer	178
Effect of CO ₂ Loading on the Corrosion of Carbon Steel in Mixed Solution of N-Methyldiethanolamine and Arginine	179
Experimental Equipment Validation for Methane (CH ₄) and Carbon Dioxide (CO ₂) Hydrates.....	180
Density Measurement of Aqueous Solution of TBAOH at Different Temperature and Concentration	181
Immobilization of Chaetoceros Sp. Biomass with Silica-Fe ₃ O ₄ Coating and Adsorption Studies Towards Cu (II) Ion Solution	190
Designing and Mathematical Modeling of Unglazed Transpired Solar Collector Experimental Setup	192
Green and Efficient Synthesis of Novel 1,3,4-Thiadiazole Derivatives in Deep Eutectic Solvent.....	193
Synthesis of Naphthalene Derivatives Using to Blue Light Poly(arylene ether)s with Investigation to Organic Light Emitting Diodes	194
Rubidium Extraction from Seawater Brine by an Integrated Membrane Distillation-Selective Sorption System.....	197
Nitrogen Compounds Characterization in Dumai Heavy Kerosene Oil from a Blend of Indonesian Crudes	200
Production of Activated Carbon from Coconut Shell (Cocos nucifera) with Chemical Activity Process of ZnCl ₂ Using Microwave	205
Tracking of Swirl Bubbles Using High Speed Camera	215
Improving Pertamina's Refinery Operation by Incorporating It's Own Catalyst & Chemicals in the Process	217

Title	Page
Yield Performance Characterization of Unconventional Fluid Catalytic Cracking Feed Blend.....	218
Amino Acid Ionic Liquid as Gas Hydrate Mitigation in Subsea Pipelines: A Review.....	219
A Pressure-Temperature Model of a Transmission Pipe During Gas Venting Process	227
Enhanced Laboratory Simulation of Complex Oil and Gas Reservoirs.....	231
A Study of Caking Behaviour of Lactose Polymorphs Under Humid Conditions.....	232
Correlation Between Cavity Fraction of Cu ²⁺ Ionic Imprinting and Concentration of H ⁺ Ion on Amino-silica Hybrid to Cu ²⁺ Ion Adsorption.....	250
The Use of Indonesian Kemenyan Extract to Control Calcium Carbonate (CaCO ₃) Scale Formation	251
Investigation of K Shell Oscillator Strengths and Related Parameters for Sb and Ce.....	253
Sonochemical Degradation of C ₄ Perfluorosurfactants: The Role of Cavitation Bubble Surface Sorption.....	254
Removal of Some Heavy Metals from Sewage Water Using Natural and Modified Rice Straw.....	273
Characteristics of Agomelatine Cocrystals Prepared by Spray Drying Process	274
Study of the Anti-solvent Process for Indomethacin-saccharin Co-crystallization Based on In-line Monitoring Systems.....	275
Analysis of Marine Fuels in Seawater Using Fourier Transform Infrared Spectroscopy (FTIR).....	276
Performance of Cellulase Enzymes from Trichoderma Reesei and Aspergillus Niger to Decompose Corncob Into Glucose: Effects of Incubation Time and Ratios of Additional Microbes.....	278
Legal Protection on Fishery Resources in the Coastal Settlement of the Bajo Tribe Gorontalo.....	279
Does Working Capital Management Create Value? Empirical Evidence from Pakistan Stock Exchange	281
An Optimal Level of Adding Relations with Long Lengths in a Pyramid Organization Structure	282

Title	Page
Dye-Sensitized Solar Cell Fabrication: Teoretical and Experimental Optimization.....	446
Biological and Electrochemical Wastewater Treatment in Decentralized Facilities Designed for Use in the Developing World	448
Targeted Doxorubicin Delivery to Bearst Cancer Cells	450
Oscillations of Microbubbles Under Ultrasound.....	451
Biological Oil Removal from Seawater by Flexible Nano Ceramic Membrane	452
MWCNTs/r-Go Hybrid Films Fabricated by Layer by Layer Assembly for Supercapacitor Electrodes	454
Experimental Investigation on the Performance of Chilled - Water Air Conditioning Unit Using Alumina Nanofluids	462
Detection of Catalase Activity with Aldehyde-doped Liquid Crystal Confined in Microcapillaries	476
The Using of Alkanolamine Compound as Capping Agent on Green-synthesis of Silver Nanoparticles	478
Green Synthesis of Nickel Ferrite (NiFe ₂ O ₄) Nanoparticles Using Leaf Extract of Gambir (<i>Uncaria gambir Roxb.</i>)	479
Additives Effects on Indium Tin Oxide (ITO) Materials Develloped Si and SiO ₂ Substrates	480
Effect of Nano-Clay on Piping Erosion in Earth Dams.....	482
The Effect of Nano-Silica and Crumb Rubber on Concrete Strength	489

Immobilization of *Chaetoceros* Sp. Biomass with Silica-Fe₃O₄ Coating and Adsorption Studies Towards Cu (II) Ion Solution

Buhani Buhani^{1,*}, Musrifatun Musrifatun¹, Dian S Pratama¹, Suharso Suharso¹,
 Rinawati Rinawati¹

¹ Department of Chemistry, Faculty of Mathematic and Natural Sciences, University of Lampung, Bandar Lampung, Indonesia

*Corresponding Author: (Phone: +62 (721) 5600974 ; Email: buhani@fmipa.unila.ac.id)

CPI: <http://procedia.org/cpi/ICONTES-4-2110920>

Abstract:

Adsorbent synthesis from *Chaetoceros* sp. (Brown algae) biomass with silica-magnetite coating technique (ASMC) and without magnetite (ASC) has been done through the sol-gel process. The both adsorbents were characterized by an infrared spectrophotometer (IR), X-Ray diffraction (XRD) and scanning electron microscopy (SEM). The primary objective of this study was to study the adsorption capacity of the material synthesized algae biomass *Chaetoceros* sp. by coating silica-magnetite, the Cu(II) ion in the singular and the competition with metal ions such as Ni(II), Zn(II), Cd(II) and Pb(II) ion as a pair ion (binary system) in the solution. The adsorption process of Cu(II) ion was performed in a single and binary systems using batch method. Interaction of Cu (II) ion with the ASC and ASMC was studied in the pH range of 2-8. Effect of pH interaction of Cu (II) ion in solution with ASC and ASMC (Figure 1) showed that the adsorption of Cu (II) ion was optimum at pH 6 with the percentage of Cu (II) ion adsorbed on the ASC and ASMC respectively by 80 and 97 % [1-2]. Effect of interaction time of Cu(II) ion on the ASC and the ASMC takes place relatively quickly. In the first 15 minutes, the adsorption increased very sharply, after 15 minutes of the second, there was a slight increase in Cu(II) ion adsorbed and achieve constant at 60 minutes. At this stage, the adsorption process is estimated to have reached equilibrium and extra time did not give rise to the amount of metal ions adsorbed significantly [3]. The Adsorption data of Cu(II) ion on the ASC and ASMC within a single system follows the pseudo kinetic model of order 2 with the adsorption rate of Cu(II) ion on the ASMC faster than the ASC. The adsorption isotherm model of Cu(II) ion on the ASC and ASMC tend to follow Langmuir adsorption isotherm model with adsorption capacity of respectively 57.77 and 105.91 mg g⁻¹. From the data competition of Cu(II) ion with ion pair of Ni(II), Zn(II), Cd(II) and Pb(II) in solution (Figure 2) can be observed that in general the ASMC adsorbent can adsorb all metal ions with a fairly high percentage, although between the metal ion pairs competed have different sizes ionic radii. Differences radius of metal ions which competed in the adsorption process is one of the determining factors of the selectivity of an adsorbent to metal ions [4]. This indicates that the ASMC is not selective for the metal ions competed. Thus, it can be stated that the ASMC adsorbent can be used in

the treatment of waste containing a mixture of multi-component metal because it is not selective for the particular metal.

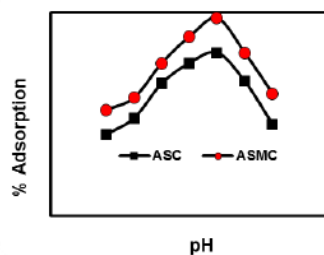


Fig. 1: Percentage of Cu(II) ion adsorbed on ASC and ASMC material at pH interval of 2-8 (Concentration of 100 mg L^{-1} and temperature of 27°C).

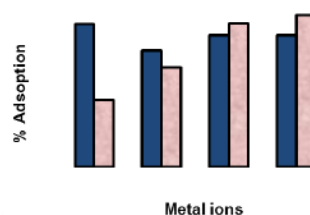


Fig. 2: Adsorption competition of Cu(II) ion to ions of Ni(II), Zn(II), Cd(II), and Pb(II) in solution on ASMC.

Keywords: adsorption capacity, *Chaetoceros* sp., heavy metals, silica-magnetite coating.

References:

- [1] Zakhama S., Dhaouadi H., Henni F.M.: Nonlinear modelisation of heavy metal removal from aqueous solution using *Ulva lactuca* algae. *Bioresource Technology*, 102, 786-796 (2011).
- [2] Lin, Y., Chen, H., Lin K., Chen B., and Chiou C.: Application of magnetic particles modified with amino groups to adsorb cooper ions in aqueous solution. *Journal of Environmental Sciences*, 23, 44-50 (2011).
- [3] Montazer-Rahmati M.M., Rabbani P., Abdolali A., Keshtkar A.R.: Kinetics and Equilibrium Studies on Biosorption of Cadmium, Lead, and Nickel Ions from Aqueous Solution by Intact and Chemically Modified Brown Algae. *Journal of Hazardous Material*, 185, 401-407 (2011).
- [4] Buhani, Narsito, Nuryono, Kunarti E.S., Suharso: Adsorption competition of Cu(II) ion in ionic pair and multi-metal solution by ionic imprinted amino-silica hybrid adsorbent. *Desalination and Water Treatment*, 55, 1240-1252 (2015).