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**In the 9th International Seminar on New Paradigm and Innovation on
Natural Science and Its Application (9th ISNPiNSA)**


Held on 22 October 2019 at Gets Hotel, Semarang, Indonesia

with paper entitled as follows:

**Silicified Coal Characteristic and Distribution at PT Mitrabara Adiperdana Tbk, North
Kalimantan for Efficient Mine Planning**




DEAN OF FSM UNDIP


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Silicified coal characteristic and distribution at pt mitrabara adiperdana Tbk, north Kalimantan for efficient mine planning

[Winarno T.](#); [Qadaryati N.](#) ; [Ginting R.A.](#)[Save all to author list](#)

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Distribution and origin of trace elements in a UK coal; the importance of pyrite

Spears, D.A. , Manzanares-Papayanopoulos, L.I. , Booth, C.A. (1999) *Fuel*

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Abstract

Silicified coal is formed by the enrichment of mineral in the coal seam. Due to the very hard form, silicified coal interferes with the effectiveness of mining causing more time for excavation. The purpose of this study was to determine the characteristics and distribution of silicified coal in PT. Mitrabara Adiperdana Tbk, which is used as a reference for selective mining. This research has conducted mapping which includes surface and subsurface data collection and laboratory tests. Surface data includes geological structure, stratigraphy, distribution patterns and observations of megascopic characteristics of silicified coal in seam 3. Subsurface data include drill point and coal seam cross-sections in Sector Y. Laboratory analysis is carried out from the outcrop coal sample and overburden of seam 3. Silicified coal in seam 3 has two types, which are type A, which is more fragile, and type B which is harder. In general, silicified coal in the research area was formed on the coal layer that has direct contact with the tuffaceous sandstones. In fault areas, silicified coals are found along the



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CONTRIBUTION OF SCIENCE TOWARD INDUSTRY 4.0 ERA

Date and Venue :

October 22, 2019

Gets Hotel Semarang - Jl. MT. Haryono No.312 - 316, Sarirejo,
Kec. Semarang Timur, Kota Semarang, Jawa Tengah 50124



The 9th International Seminar on New Paradigm and Innovation on Natural Science and Its Application

October 22, 2019

Semarang, Indonesia



LIST OF SPEAKER**I. Keynote Speaker**

No.	Name	Research Field	Institution	Country
1.	Prof. Emmanuel Cornillot	Biotechnology	Universite de Montpellier	Perancis
2.	Prof. Dr. Baba Musta	Geochemistry	Faculty of Science, UMS	Malaysia
3.	Prof. Dr. Ir. Rokhmin Dahuri, MS.	Marine Resource and Environmental Studies	President of Indonesian Aquaculture Society; Proffesor in Marine Resource and Environmental Studies	Indonesia
4.	Sapto P. Putro, M.Si., Ph.D.	Marine Ecology and Aquaculture	Faculty of Science and Mathematics, Diponegoro University	Indonesia

II. Invited Speaker

No.	Name	Department	Institution	Country
1.	Dinar Mutiara Kusumo Nugraheni, S.T., M.InfoTech.(Comp).	Computer Science	FSM UNDIP	Indonesia
2.	Dr. Eng. Ali Khumaeni, S.Si., MS	Physics	FSM UNDIP	Indonesia
3.	Dr. M. Cholid Djunaidi, M.Si.	Chemistry	FSM UNDIP	Indonesia
4.	Dr. Lilih Khotimperwati, S.Si., M.Si.	Biology	FSM UNDIP	Indonesia
5.	Dr. Tarno, M.Si.	Chemistry	FSM UNDIP	Indonesia
6.	Farikhin, M.Sc. Ph.D.	Mathematics	FSM UNDIP	Indonesia

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15. Alik Maulidiyah, S.Si. M.Sc.
16. Rahmawan Bagus Trianto, S.Kom.
17. Deby Yuniarto
18. Siswoyo

Table of contents

Volume 1524

2020

◀ Previous issue Next issue ▶

The 9th International Seminar on New Paradigm and Innovation of Natural Sciences and its Application 22 October 2019, Central Java, Indonesia

Accepted papers received: 16 April 2020

Published online: 22 June 2020

Open all abstracts

Preface

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OPEN ACCESS 011002

Peer review statement

+ Open abstract  View article  PDF

Papers

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Ion wind drying with input power variation of the potato slices

S Sumariyah, A Khuriati, S H Pratiwi and E Fachriyah

+ Open abstract  View article  PDF

OPEN ACCESS 012002

Numerical calculation based on mass and energy balance of waste incineration in the fixed bed reactor

A Khuriati, P Purwanto, H S Huboyo, S Sumariyah, S Suryono and A B Putranto

+ Open abstract  View article  PDF

OPEN ACCESS 012003

Medical image processing using python and open cv

C E Widodo, K Adi and R Gernowo

+ Open abstract  View article  PDF

OPEN ACCESS 012004

The use of raspberry pi as a portable medical image processing



C E Widodo, K Adi and I Gunadi

+ Open abstract  View article  PDF

OPEN ACCESS 012005

Interaction between madden-Julian oscillation and monsoon related to big floods over south sulawesi in january 2019

E Hermawan, T Harjana, A Ridho and T Maulana

+ Open abstract  View article  PDF

Policy

+ Open abstract  View article  PDF



-
- OPEN ACCESS** 012006
Merapi observed gravity anomaly changes in 2019
D I Rina and M N Irham
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012007
The contribution of fatty acids composition of soybean oil on natural and electro-optics polarization
A Rahmawati, K S Firdausi, H Sugito, M Azzam, V Richardina and Q M B Susanto
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012008
Face geometry as a biometric-based identification system
C E Widodo and K Adi
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012009
Measurement of information quality on mozita application uses the weighted average model
A P Widodo, K Adi, S A Nugraheni and W Indri
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012010
Identification of subsurface fluid flow using the 2D geoelectric method in Marunda, North Jakarta
M Farhan and M S Rosid
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012011
Cleaner sheep leather tanning process using *uncaria gambir*: the influence of rebating on leather properties
G Griyanitasari, D Rahmawati, Sugihartono and Y Erwanto
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012012
Horizontal gradient analysis of gravity data for subsurface fluid flow identification (case study: cilincing, north jakarta)
R P Hertiansa and M S Rosid
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012013
Relationship between environmental knowledge understanding towards conservation attitudes of Earth Hour Semarang volunteers
M Ripa'i and A P Purwanto
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012014
Electrohydrodynamic drying of plant seeds with the shape variation
S Sumariyah, A Khuriati, E Fachriyah and S H Pratiwi
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012015
Calculating ground shear strain (GSS) of microtremor data using graphical user interface python programming
S Ina, G Yuliyanto and M N Irham
[+ Open abstract](#) [View article](#) [PDF](#)
-

-
- OPEN ACCESS** 012016
Real-time vehicles velocity monitoring and crossroads evaluation using rule-based RESTful maps API service
A Hartanto, F Farikhin and S Suryono
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012017
Delineation of the new site of ngempon temple in ngempon village, bergas district, semarang regency using the microtremor method
M A Ubaidillah, G Yuliyanto and M N Irham
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012018
Measurement of eye lens doses estimation in interventional radiology
Z Arifin, E Setiawati, A A Putri, E Hidayanto, Heriyani, A D Reskianto and Rusmanto
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012019
Study of low head turbine propellers axial flow for use of micro-hydropower plant (MHP) in Aceh, Indonesia
Pribadyo, H Hadiyanto and J Jamari
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012020
Burnup computation for HTR-10 using MCNPX as the function of radius and fuel enrichment
E Setiawati, S Juliawan, F Arianto and A Margiantono
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012021
Database replication method for real-time measurement pH parameter of fishery using a wireless sensor system
W H Sugiharto, M I Ghozali, H Susanto, M A Budihardjo and S Suryono
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012022
Development of electrooptic devices by strengthening electromagnetic fields using colloidal silver solutions
H Sugito, A Khumaeni, K S Firdausi and M Azam
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012023
Authentication of gold jewelry based on elemental composition using laser-induced breakdown spectroscopy
D Angraini, A Khumaeni, B S Hartadi, H Sugito and A Y Wardaya
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012024
Synthesis of gadolinium nanoparticles in spinach-extracted liquid using a pulse laser ablation method
S Avicenna, I Nurhasanah and A Khumaeni
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012025
Effects of repetition rate on the identification of elements in gemstone using the LIBS method
A Bagaskara, Q M B Soesanto, H Sugito and A Khumaeni
[+ Open abstract](#) [View article](#) [PDF](#)

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-
- OPEN ACCESS** 012026
Analysis of signal to noise ratio from 1.5 tesla MRI head coil phantom image on daily quality assurance
G Maslebu, E S D Kusri and A Setiawan
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012027
Fabrication and properties of high efficiency dye-sensitized solar cells (DSSCs) with photon absorption optimization
J E Suseno, A Y Wardaya and A Khumaeni
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012028
Characterization of the radiosensitization effect of pulsed laser ablated-gadolinium
S A Paramita, I Nurhasanah, A Khumaeni and Z Arifin
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012029
Low-temperature process for green tea drying using zeolite adsorption integrated fluidized bed dryer
S U Handayani, V Paramita, M E Yulianto and A P Siswanto
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012030
Energy and exergy analysis economic of continuous vibrating fluidized bed drying on celery drying
S U Handayani, I S Atmanto, F T Putri and S Fujiwara
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012031
Characterization of negative corona plasma discharge reactor using point-to-plane electrode configuration in atmospheric pressure and its application in the treatment of woven natural silk
Z Muhlisin, I Rahmawati, F Arianto and P Triadyaksa
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012032
Growth of collagen-nanosilver (Co-AgNP) biocomposite film with electrospinning method for wound healing applications
A Subagio, N A K Umiati and V Gunawan
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012033
Construction of lyapunov function using gradient method to stability analysis of the nitrogen-phosphate-phytoplankton-sediment interaction model
Widowati, S P Putro and E Triyana
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012034
K-nearest neighbor (KNN) with global GINI diversity index for classification subsidy food in Semarang city, Indonesia
D Ispriyanti, A Prahutama and Mustafid
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012035
Hoax news validation using similarity algorithms
[+ Open abstract](#) [View article](#) [PDF](#)

S Y Yuliani, S Sahib, M F Abdollah, Y S Wijaya and N H M Yusoff

[+ Open abstract](#) [View article](#) [PDF](#)

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012036

3D modeling of subsurface jiwo fault around gantiwarno sub-district, klaten district, central java using the magnetic method

T Yulianto, M N Irham, D P Sasongko and S Widada

[+ Open abstract](#) [View article](#) [PDF](#)

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012037

Rice crop management expert system with forwarding chaining method and certainty factor

Kharisma, K Adi and R R Isnanto

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012038

Pictures on the second homotopy module of the group from Kronecker product on the representation quaternion group

A M Zakiya, Y Yanita and I M Arnawa

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012039

The first fundamental group of Kronecker quaternion group

A Adrianda and Y Yanita

[+ Open abstract](#) [View article](#) [PDF](#)

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012040

Village classification index prediction using geographically weighted panel regression

A S Ningrum, A Rusgiyono and A Prahutama

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012041

Efficiency nonminimally supported design for three parameters weighted exponential model

T Widiarihi, M A Mukid and Mustafid

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012042

Γ – semigroup generated by a semigroup

Y D Sumanto, A Aziz, Solikhin and S Hariyanto

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012043

An analytic solution of the uncoupled multi-agent model and its benefit through optimal control system with attractor and repellant

R H Tjahjana

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012044

The algebraic structure on the neutrosophic triplet set

S Suryoto, Harjito and T Udjiani

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- OPEN ACCESS** 012045
Weakly compact linear operators on space of Dunford integral function
S Solikhin, S Hariyanto, Y D Sumanto and A Aziz
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012046
WAC4 algorithm to solve the multiperiod degree constrained minimum spanning tree problem
Wamiliana, A Junaidi, Amanto, M Usman and Warsono
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012047
Counting the number of vertexes labeled connected graphs of order five with minimum five edges and maximum ten parallel edges
Amanto, Notiragayu, F C Puri, Y Antoni and Wamiliana
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012048
Comparison of performance of k-nearest neighbor algorithm using smote and k-nearest neighbor algorithm without smote in diagnosis of diabetes disease in balanced data
A G Pertiwi, N Bachtiar, R Kusumaningrum, I Waspada and A Wibowo
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012049
Analysis of variance for strip plot design with missing values: bias correction of the mean squares
K Nisa, N Hamsyah, M Usman and Warsono
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012050
3D modeling of buried site ngempon temple, bergas, semarang regency using HVSR method
G Yuliyanto
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012051
Forecasting the number of airplane passengers uses the double and the triple exponential smoothing method
Ramadiani, R Syahrani, I F Astuti and Azainil
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012052
Globally stability analysis of the mathematical model in the IMTA system by using the energy-Casimir method
E Triyana, Widowati and S P Putro
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012053
Stability analysis of mathematical model (*sirb*) in the spread of cholera with vaccination and disinfection
A Fitriyani, Widowati and Farikhin
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012054
Secondary metabolites in *elaecarpus grandiflorus* cell culture in WPM medium with various concentrations of PGR



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OPEN ACCESS 012055

The impact of mangrove plantation in ponds on the secondary metabolite content

E D Hastuti, M Izzati and S Darmanti

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OPEN ACCESS 012056

Analysis total plate count (tpc) and organoleptic test on seaweed chips

M Zainuri, H Endrawati, S Winarni, F Arifan, A Setyawan and H P Hapsari

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OPEN ACCESS 012057

Characterization of citronella grass essential oil of *Cymbopogon winterianus* from Batang region, Indonesia

H P Kusumaningrum, M Zainuri, H Endrawati and E D Purbajanti

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OPEN ACCESS 012058

The production of alkaline protease from *Aspergillus flavus* DUCC K225 on rice bran containing medium

I Rukmi and S Purwantisari

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OPEN ACCESS 012059

Histologic response of aortic *Rattus norvegicus* male strain wistar hyperlipidemia after giving kersen fruits juice and extract lakum leaves

E Agustina, T R Saraswati and S Tana

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OPEN ACCESS 012060

Antibacterial activity of basil oil (*Ocimum basilicum* L) and basil oil nanoemulsion

E Fachriyah, P J Wibawa and A Awaliyah

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OPEN ACCESS 012061

The potency of B-G31 isolate associating with *valanganigricornis* as a probiotic candidate to digest cellulose

R Abdullah, F D Imtiyaz, Wijanarka and Nurhayati

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OPEN ACCESS 012062

Isolation and identification of rare actinomycete-like bacteria from soil-based on 16S ribosomal RNA gene sequences

Y Eshananda, F Ningsih, Y Sakai, A Yokota, S Yabe and W Sjamsuridzal

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The potential of mixed epibiotic (binahong leaves, *anrederacordifolia*, and garlic, *allium sativum*, extracts) as a feed additive to combat *aeromonashydrophilainfection* on catfish (*clariasgariepinus*)

Sarjito, S B Prayitno, N T Kusuma and Desrina

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The density of microplastic in sea cucumber (*Holothuria* sp.) and sediment at Tidung Besar and Bira Besar island, Jakarta

B H Sayogo, M P Patria and N D Takarina

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012065

Analysis of total plate count and fungus yeast of mahkota dewa fruit as raw material for making syrup

S Winarni, F Arifan, A Setyawan, A Nurdiana and Windari

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OPEN ACCESS

012066

Production of coco-vinegar in a bubble biofermentor

S N Jannah, S Purwantisari, D Handayani, I Hartati and M E Yulianto

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012067

Antibacterial activity tests of isolate endophytic bacteria from the tea plant (*Camellia sinensis*) againts *Staphylococcus aureus* and *Staphylococcus epidermidis*

S A Sari, S Pujiyanto and A Suprihadi

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012068

The control system for the nutrition concentration of hydroponic using web server

J E Suseno, M F Munandar and A S Priyono

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012069

Leaf anatomy response of several varieties of rice (*Oryza sativa* L.) to the application of silica fertilizers

Kristamtini, C A Wirasti, S Widodo and Sudarmaji

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012070

Preparation and characterization of lignin nanoparticles from rice straw after biosynthesis using *Lactobacillus bulgaricus*

R Rismawati, I A Nurdin, M N Pradiptha, A Maulidiyah and N J Mubarakati

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012071

Bioethanol production using the SSF method (*simultaneous saccharification and fermentation*) of microalgae *anabaena* sp.

N S Permatasari, M Zainuri, H P Kusumaningrum, I Mishbach and E D Hastuti

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012072

Morphotypes and molecular characterisation of pink pigmented bacterial symbiont of *Turbinaria* sp.

A T Lunggani, E Kusdiyantini and F D Intiyaz

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012073


The test anti-inflammatory activity of infusing Bryophyllum pinnatum (*Kalanchoe pinnata*) leaves (*Kalanchoe pinnata*) on edema in mice leg thigh male swiss webster


M S Sudirman and M Dya

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The food plant ethnobotany of Ampari tribe community in Papua, Indonesia
H F Waroy, S Utami and Jumari
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012075
Molecular identification and antioxidant test of *Chaetoceros* sp. from Gondol, Bali
M A Susetyo, H P Kusumaningrum, S N Jannah and R Abdullah
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012076
Metagenome analysis of gut microbial in both the caged and non-caged ducks
R Susanti, A Yuniastuti and F Fibriana
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012077
Gold imprinted adsorption based on eugenol
M C Djunaidi
[+ Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012078
Finding parameters relationship for disinfectant gas production
M Facta, H Hermawan, N A K Umiati and M Amjad
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The influence of high energy milling to the adsorption of Cd(II) and Zn(II) ions on activated zeolite
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Probing the interaction between EC1-EC2 domain of E-cadherin with conformational structure of cyclic ADTC7 (Ac-CDTPDC-NH₂) peptide using molecular docking approach
P Siahaan, N E Darmastuti, S Aisyafalah, N A Sasongko, D Hudiyanti, M Asy'ari and V D Prasasty
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Potential of phytotechnology in wastewater treatments to produce alternative electrical energy: a review
B Zaman, B P Samadikun, M A Budihardjo, N Hardyanti, A F Rachma and S I Hasna
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Purwoceng chemical characterization by FTIR spectrum and feasibility analysis of jelly purwoceng diversification with the addition of gelatine and carrageenan
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Preliminary study of auto catalytic palm oil hydrolysis into fatty acid through hydrothermalolysis process
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Electrolysis results in a comparison of metformin using aluminum, zinc, and iron (as the anode) as well as used carbon (as the cathode)
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Synthesis of silica-rich zeolite using quaternary ammonium-based templates
S Sriatun, H Susanto, W Widayat, A Darmawan, S Sriyanti, R Kurniasari and R Kurniawati
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Removal of Pb^{2+} metal ion using electrolysis system of $Fe(s)/NaCl(aq), Pb(NO_3)_2(aq)/H_2O(aq)/C(s)$
L Suyati, D Efendi, G Gunawan, A Haris and D S Widodo
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Effects of percent weight of divinylbenzene as crosslinking agent on the properties of eugenol–divinylbenzene copolymers
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Synthesis of derivatives azomethine compounds bonded to alkoxyated benzene and their antibacterial activity tests
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Economic analysis of planning for utilization of tabang hydro power plant
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Usability testing mozita application based on use questionnaire model
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The use of mobilenet v1 for identifying various types of freshwater fish
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The best architecture selection with deep neural network (DNN) method for breast cancer classification using MicroRNA data
S Ginanjar, Suhartono, A Wibowo and E A Sarwoko
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Evaluation of student academic performance using e-learning with the association rules method and the importance of performance analysis
R Ramadiani, A Kurniawan, Z Arifin, M L Jundillah, R Alex, A Azainil and A N Hidayanto
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QoS of network infrastructure in a wireless sensor system for real-time measurement pH parameter of fishery
M I Ghozali, W H Sugiharto, H Susanto, M A Budihardjo and S Suryono
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Consumer purchase patterns based on market basket analysis using apriori algorithms
A R Efrat, R Gernowo and Farikhin
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Portable machine with android application display for measuring CO and HC of vehicle exhaust gas
H Supriyono, S Anton, U Fadlilah and K Harismah
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Development of a smart parking system based on internet of things using object-oriented analysis and design method
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Designing advertisement board game and examining factors correlated with board gaming behaviors
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The analysis correlation aspects of usability in Sipetang (case study: central java prosecutor)

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Improvement of image quality with fusion in radiography of high and low intensity lateral head

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Probability of caused factors stroke disease use link and reliability functions

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Signal to noise ratio and anatomical information of T1-weighted spin echo and T1-weighted SPIR in post-contrast brain MRI metastases case

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The lipid profile of rats (*Rattus norvegicus L.*) induced by high fat ration after exposed to ethanolic neem (*Azadirachta indica*) leaf extract

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Topical ozonated virgin coconut oil improves diabetic ulcer wound healing in diabetic mice model

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Dynamical analysis model of HIV-1 infection in CD4⁺ T cells with antibody response

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Classification of liver cancer with microrna data using the deep neural network (DNN) method

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Analysis stability of HIV/AIDS epidemic model of different infection stage in closed community

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Effectiveness of *Psidium guajava* to increase hemoglobin and hematocrit levels of third trimester in pregnancy

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The growth and potential of *gamma-aminobutyric acid* (GABA) by lactic acid bacteria isolated from fish fermented food from Maluku, Indonesia
A L O Putri, E Kusdiyantini and S Pujiyanto
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Planning for the utilization of hydro power in the Belayan river, East Kalimantan
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Analysis of railway noise level against the level of disruption of communities living in the area around the railway in the Semarang city
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Study on water quality physical-chemical parameters aquaculture areas in Menjangan Besar Island, Kepulauan Karimunjawa, Jepara, Indonesia
R Farantika, S P Putro, M Hadi and I Triarso
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Generalized of properties symmetric element on rings with involution
T Udjiani, Suryoto and Harjito
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Non-Poisson queue with normal logistic distribution (case study in Semarang automatic toll gate)
Sugito, A Prahutama, D Ispriyanti and Mustafid
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Assessment of environmental status of coastal mangrove area using macrobenthic assemblages: a study case at Tapak Mangrove area, Semarang, Central Java
S P Putro, S Adhy, H Safrijal and F Muhammad
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A description of the characteristics of shallot farmers using pesticides
S Winarni, H Susanto, A Kartini, A Suwondo, C Nissa and Dharminto
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The diversity of fern in Petungkriyono mixed forest Pekalongan, Central Java
Daisyari, Murningsih and S Utami



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Desalination of seawater with supported liquid membrane

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Subsurface mapping of University Diponegoro Tembalang campus based on resistivity data

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Silicified coal characteristic and distribution at pt mitrabara adiperdana Tbk, north Kalimantan for efficient mine planning

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Abstract. Silicified coal is formed by the enrichment of mineral in the coal seam. Due to the very hard form, silicified coal interferes with the effectiveness of mining causing more time for excavation. The purpose of this study was to determine the characteristics and distribution of silicified coal in PT. Mitrabara Adiperdana Tbk, which is used as a reference for selective mining. This research has conducted mapping which includes surface and subsurface data collection and laboratory tests. Surface data includes geological structure, stratigraphy, distribution patterns and observations of megascopic characteristics of silicified coal in seam 3. Subsurface data include drill point and coal seam cross-sections in Sector Y. Laboratory analysis is carried out from the outcrop coal sample and overburden of seam 3. Silicified coal in seam 3 has two types, which are type A, which is more fragile, and type B which is harder. In general, silicified coal in the research area was formed on the coal layer that has direct contact with the tuffaceous sandstones. In fault areas, silicified coals are found along the fracture zone where coal seams come in contact with tuffaceous sandstones. Thus, the recommended mining area is based on the silicified coal distribution map.

1. Introduction

The presence of silica in the coal can form hard coal, called silicified coal [1]. The existence of silicified coal in the coal seam can disrupt the mining production, both the production and the coal quality [2]. Silicified coal can be classified into three diagenetic processes of wood silicification, namely detrital diagenetic, initial diagenetic and late diagenetic [3]. Detrital quartz which is a part of silica minerals generally has unclear boundaries (anhedral), un-uniform grain size, has a lot of clay mineral content, contains an inclusion of organic material and not fill the fracture [4]. Thin section of diagenetic quartz in petrographic analysis generally shows the euhedral subhedral form and uniform grain size forms lamination structure (fissure filling) and contains small clay mineral [4].

Pujobroto [5] explained the formation of silicification in coal. During the process of volcanic activity, peat will be covered by volcanic material. The sedimentation process causes the peat layer to experience pressure due to the volcanic material above it. The volcanoclastics is a material that is rich in silica, and when sedimentation happened to be above the peat layer, the silica content will be mixed with peat water. With the hydrogeological process, silica-rich water leaks into the peat layer. Precipitated silica water then replaces plant tissue. Coal silicification can begin during the initial stages of coalification or even the development stage of peat which forms diagenetic silica by the process of recrystallization of the saturated silica solution [6].



Isolation and identification of rare actinomycete-like bacteria from soil-based on 16S ribosomal RNA gene sequences

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Abstract. The rare actinomycete-like bacteria are mycelium-forming bacteria other than phylum *Actinobacteria* that difficult to isolate and cultivate. This group of bacteria was recently speculated by many scientists as a potential new microbial resource for the discovery of novel compounds, as a substitute for actinomycetes. In this study, we isolate and identify rare actinomycete-like bacteria from forest soil collected under bamboo trees, near the Cisolok Geysers, Sukabumi, Indonesia. The isolation of bacteria was performed using Reasoner's 2A (1:10 dilution) medium with 2% gellan gum instead of agar and incubated at 30 °C for three weeks. The 16S rRNA gene sequences of the isolates were examined to determine their taxonomic position. Four isolates designated K17-1, K17-2, K42, and K44 showed pale orange colonies and formed mycelia were obtained. The results of 16S rRNA gene sequences of these isolates showed high similarity to members of the genus *Dictyobacter* in the family *Dictyobacteraceae* of the class *Ktedonobacteria* of the phylum *Chloroflexi*, with values 97.16-98.02%, and most closely related to the species *Dictyobacteraurantiacus* S-27^T (97.16-98.02% similarities). This result suggested that the member of the class *Ktedonobacteria*, which considered as rare actinomycete-like bacteria, such as *Dictyobacter* could be found in the forest soil of the geothermal area.

1. Introduction

Actinobacteria are gram-positive bacteria that have a high percentage of guanine and cytosine in their genome [1]. This group morphologically comprises unicellular organisms to mycelium-forming bacteria which called Actinomycetes [1,2]. However, bacteria that have filamentous appearance also could be found in the phylum *Chloroflexi*. The member of this phylum which has actinomycete-like morphology is present in the four different class namely *Chloroflexi*, *Anaerolineae*, *Caldilineae* and *Ktedonobacteria* [3]. Among these class, *Ktedonobacteria* has some obvious morphological features which distinguish themselves from others. The member of *Ktedonobacteria* are aerobic organism and forming branched mycelia with spores like actinomycetes [3,4]. Moreover, most validly published strains of *Ktedonobacteria* budding their multiple spores per cell on the aerial mycelium which unique among bacteria [5]. All of *Ktedonobacteria* identified as gram-positive bacteria while almost of the member in phylum *Chloroflexi* were gram-negative [3,6]. Based on these exceptional characters, class *Ktedonobacteria* could be included as the rare actinomycete-like bacteria.

Rare actinomycete-like bacteria could provide an alternative for the discovery of new compounds derived from microorganisms because spore formation usually would be followed by the production of secondary metabolites [7,8]. Further analysis of the genomic of nine members of rare actinomycete-like bacteria

