

Advanced Materials Science

Selected peer-reviewed extended articles
based on abstracts presented at the
5th International Conference on
Advanced Materials Science (ICoAMS 2022)

Aggregated Book

Edited by

**Prof. Dr. Sarjito, Assoc. Prof. Dr. Waluyo Adi Siswanto,
Assoc. Prof. Dr. Mohammad Sukri Mustapa,
Assoc. Prof. Dr. Tri Widodo Besar Riyadi
and Assoc. Prof. Dr. Agus Dwi Anggono**



Copyright © 2023 Trans Tech Publications Ltd, Switzerland

All rights reserved. No part of the contents of this publication may be reproduced or transmitted in any form or by any means without the written permission of the publisher.

Trans Tech Publications Ltd
Seestrasse 24c
CH-8806 Baech
Switzerland
<https://www.scientific.net>

Volume 44 of
Scientific Books Collection
ISBN 978-3-0364-0116-4

Full text available online at <https://www.scientific.net>

Distributed worldwide by
Trans Tech Publications Ltd
Seestrasse 24c
CH-8806 Baech
Switzerland
Phone: +41 (44) 922 10 22
e-mail: sales@scientific.net

Printed with permission by
Curran Associates Inc. (2023)

CURRAN ASSOCIATES INC.
proceedings
.com

Additional copies of this
publication are available from:

Web: www.proceedings.com/69097.html

Table of Contents

Preface	v
Committee	vi

Chapter 1: Biotechnologies and Biomedical Applications

Facile Preparation of Multifunctional Ag-Fe_xO_y/C Composite from Coffee Husk for Antibacterial and Catalytic Applications

- A.N.T. Le, H.H. Lam, T.M. Tran Thuy, L.Q. Nguyen, N.T.H. Duong, T.M. Nguyen and D.V. Nguyen 3

Pyrolysis Kinetic Analysis of Palm Kernel Shells Using Free Model Method: Effect of Heating Rate and Iron Ore Catalyst

- A. Zulkania, G. Fitriani and I. Irawati 11

Analysis Model of Physical Characteristics Sawdust Materials Through the Carbonization Process

- Musabbikhah and Suranto 19

Injection Molding Characterization of PLA and Chitosan Mixtures for Biomaterial Applications

- P.H. Setyarini, M.P. Anggarwati, S. Wahyudi, D.H. Sulistyarini and Purnomo 27

Chapter 2: Materials and Technologies for Environmental Protection

Octahedral Molecular Sieve Manganese Oxide: Feasible Material for Hg(II) Remediation

- T.M. Tran Thuy and D.V. Nguyen 35

Preparation of PVA/Chitosan/Zeolite Composite and its Antibacterial Activity for Water Treatment

- L.P. Quynh, L.N. Quang, N.K.M. Tam and L.Q. Nguyen 41

An Ultrafast and Green Synthesis of Mesoporous Zeolite X for Great Enhancement in Methylene Blue Adsorption

- N.T.T. Phuong, C.H. Minh, H.H. Lam, N.T.H. Duong and L.Q. Nguyen 49

Effect of Microwave-Assisted Method on Antibiotic Adsorption Capacity of Activated Carbon from Grapefruit

- V.T. Lam, B. Hoang and N.T.C. Quyen 57

Chapter 3: Polymers and Composites

Examination of Thermoplastic Polymers for Splicing and Bending

- P.H. Tjahjanti, Iswanto, E. Widodo and S. Pamuji 67

Preliminary Study on Mechanical Properties of 3D-Printed Carbon-PLA Filament with Different Printing Orientation for SUAV Wings Application

- M.A.F. Hendrawan, K.A. Ilman, A.D. Anggono, B.W. Febriantoko, Y. Mat Daud, L. Musa, M.S.M. Rasidi, A. Azrem Azmi and L.H. Ibrahim 79

Chapter 4: Silica Nanoparticles**Preliminary Study of Modified Fluorescent Silica Nanoparticles for the Detection of IgY Antibody**

- F. Apriyani, D. Julyansyah, M. Angelina, A. Randy, R.V. Manurung, B. Yuliarto and S.N.A. Jenie..... 87

Comparative X-Ray Diffraction (XRD) Study on the Synthesis of Natural Based Magnetic Silica Nanoparticles

- M.Y. Maulana, B. Yuliarto, S.N.A. Jenie and N.L.W. Septiani 93

Biosynthesis of Silver Nano/Micro-Particles Using *Sambiloto (Andrographis paniculata)* Leaves Extract: Effect of AgNO₃ Solution Concentrations

- A. Chafidz, P. Hidayat, S. Maulana, E.H. Ramadhan, H. Prasetyawan, M. Kaavessina and N. Hendrawati 101

Chapter 5: Materials and Technologies in Chemical Production**The Energy Potential of Glassy Volcanic Rock for Cellular Glass Production**

- E. Sahakyan and M. Kalantaryan..... 109

Hydrogen Production from Waste Aluminum Foil AA1235 Using the Aluminum-Water Reaction Method with Thickness Variations

- F.R. Maulana, N. Fadhilah, R. Agung Wahyuono and D.D. Risanti 115

Chapter 6: Machines and Equipment**Characterization of Fiber Bragg Grating (FBG) for Weight Measurement System**

- N.H. Fatimah, D. Hanto, K.C. Nugroho, M. Muhammad, Z. Ismail, R. Rahmat and A. Rosyida 125

Characteristic of Bolt and Nut Pressure Switch of Cessna Caravan Type 208B

- I. Suroso and D. Wicaksono..... 133

Modified Copper for Reducing CO and HC Vehicle Exhaust Gas Emissions

- A.S. Nugroho, Suhartoyo, Y.Y. Kristiawan and Karminto 141

Chapter 7: Properties and Processing Technologies of Structural Metals**Microstructure Evolution and Hardness Properties of Nodular Cast Iron for Varying Tempering Time**

- H. Oktadinata, M.S. Dafi and D.H. Prajitno 149

Microstructure Refinement by Austenizing and Tempering in Low Alloy Carbon Steel Casting

- M. Chamim, Haikal, M. Vendy and N.H. Fatimah..... 157

Analysis of the Effect of Time on Tensile Strength and Hardness of Electroplating Method Using Nickel on Aluminum 7075

- F. Setiawan, D. Walikram, Sehono, T. Ariebowo and I.R. Putra 163

Comparison of Microstructure, Yield Strength, Tensile Strength, and Modulus of Elasticity between Gray Cast Iron and Nodular Cast Iron

- A.S. Darmawan, A.D. Anggono, A. Yulianto, B.W. Febriantoko, Masyrukan and A. Hamid..... 171

Corrosion Resistance Analysis of Al-Cu, Al-Zn and Al-Cu-Zn Alloys

- W. Suprapto, Zuliantoni, P.H. Setyarini, F. Gapsari, Sudjito and Y.S. Irawan..... 179

Hydroxyapatite Effect on the Corrosion Rate of AMC Al-Zn by Powder Metallurgy	
Zuliantoni, W. Suprapto, P.H. Setyarini and F. Gapsari.....	187
Aluminum Oyster Mushroom Frying Surface Quality Improvement through Anodizing	
A. Rachmawati, P.H. Setyarini, V.I. Mahendra, A.M. Wati, S. Fajriani, M.A. Ambayoen and S. Azizah	195
Secondary Material Casting of Al-Si for Making Handle Brake in Variation of Duct	
P. Partono, N. Hidayat, Masyrukan and M.R. Pangaribawa.....	201
The Effect of Finishing Allowance and Milling Methode on Surface Roughness in the Finishing Process of Al5052 and Al7075	
Burhanudin, Margono, E. Suryono, N.T. Atmoko and Zainuddin	209
Mechanical Properties and Microstructure Evolution of Double-Sided Friction Stir Welding AA6061-T6	
Hendrato, Jamasri, Triyono and P. Puspitasari	219
 Keyword Index	229
Author Index	231