

Table of Contents

Preface

Chapter 1: Environmental Chemistry

Greener Procedure of Dithizone Immobilization on Coal Bottom Ash for Heavy Metal Adsorbent: Synthesis Optimization and Characterization B.N. Huda, E.T. Wahyuni and M. Mudasir	3
Immobilization of Dithizone on Coal Fly Ash in Alkaline Medium as Adsorbent of Cd(II) Ion G. Miranda, E.T. Wahyuni and M. Mudasir	11
Modification of Coal Fly Ash with Dithizone for Adsorption of Ni(II) Metal Ion D.N. Rohmah, N.H. Aprilita and M. Mudasir	20
Citric and Tartaric Acids Effect on Zn²⁺ Desorption in the Soil around Textile Industry Area-Yogyakarta F.F. Oktavianti, T.A. Natsir and S. Suherman	28
Synthesis of Polymer-Derived Carbon for Ibuprofen Removal from Simulated Wastewater A.S. Mutia, I. Prasetyo and T. Ariyanto	34
Hydrocracking of LDPE Plastic Wastes into Liquid Fuel by Natural Zeolite Supported Nickel Metal M. Taufiqurrohaman, K. Wijaya, A. Nadia, S.E. Purba and A. Syoufian	41
Adsorption of Coomassie Brilliant Blue by Alginate-Chitosan Nanoparticles J.A. Putri, A. Suratman and R. Roto	46

Chapter 2: Agricultural Chemistry

Synthesis Bioplastic Fertilizer of Carboxymethyl Cellulose/N-P-K/Zeolite Using Twin-Screw Extruder as a Model Slow-Release S. Wahyuni, S. Suyanta, B.B. Sedayu, W. Nafisyah and I. Kartini	59
The Effect of Polyurethane Multilayer Coating on Nitrogen Release from Controlled Release Fertilizer A.R. Wicaksono, Y. Kusumastuti and J. Widada	65
Kinetics Study of Chicken Breast Meat (<i>Pectoralis major</i>) Color Changes Measured Using the TCS 3200 Color Sensor during Storage at Room Temperature P.W. Nastiti, N. Bintoro, J.N.W. Karyadi and S. Rahayoe	72
Identification of Toxic Heavy Metals and Trace Elements in Pesticides Used by Shallots (<i>Allium Cepa</i> Var. <i>Aggregatum</i>) Farmers in Brebes District, Indonesia S. Murniasih, S.J. Santosa and R. Roto	80
Synthesis of Carboxymethyl Cellulose/Bentonite/N-P-K Composite as Slow-Release Fertilizer Model Using Twin-Screw Extruder W. Nafisyah, S. Sutarno, B.B. Sedayu, S. Wahyuni and I. Kartini	89
Vis-NIR Spectroscopy and PLS-Da Model for Classification of Arabica and Robusta Roasted Coffee Bean M.F.R. Pahlawan and R.E. Masithoh	97

Chapter 3: Biomaterials and Pharmaceutical Chemistry

One-Pot Synthesis and Antioxidant Activity of 4-Phenoxyquinoline Derivative from Clove Leaf Oil S.M. Lubis, M.F. Hariadi, N. Amalia, M. Inung, B. Purwono, Priatmoko and M.I.D. Mardjan	107
Synthesis, Characterization and Molecular Docking of New Naphthalene-Based Chalcone and Pyrazoline Compounds T.E. Othmani, M.M. Alidmat, M. Khairuddean and T.D. Wahyuningsih	113

Molecular Docking Study, Synthesis and Characterization of New Hybrid Anthracene-Thiophene Compounds with Chalcone and Pyridine Scaffolds B.I. Bakar, M.M. Alidmat, M. Khairuddean and T.D. Wahyuningsih	121
Effect of Titania and Silver Nanoparticles on the Tensile Strength of Cement-Like Mineral Trioxide Aggregate M.W.A. Wibowo, A.I. Yunita, L. Mukaromah, I. Kartini and N. Nuryono	128
Synthesis of White Mineral Trioxide Aggregate (WMTA) Using Silica from Rice Husk Ash and CaCO₃ from Limestone A.I. Yunita, M.W.A. Wibowo, S. Suyanta and N. Nuryono	134
Designing Derivative Compounds of 4-Chlorophenyloxy N-Alkyl Phosphoramidates as Anti-Cervical Cancer Agents Based on QSAR Model C.A. Utri, H.D. Pranowo and D. Pranowo	141
Molecular Docking Study for Prediction of Chiral HPLC Separation of Hydroxychloroquine as an Alternative Antiviral of SARS-CoV-2 P.C. Moneteringtyas, A. Kuncaka, D. Hermawan and M. Mudasir	149
Molecular Docking Approach for Prediction of Enantioseparation of Chiral Ibuprofen by α-1-Acid Glycoprotein Column U.R. Putri, D. Siswanta, D. Hermawan and M. Mudasir	157
Molecular Docking Approach for Prediction of Chromatographic Chiral Separation of Ketorolac Using AGP Column R. Sabdowati, D. Siswanta, D. Hermawan and M. Mudasir	163

Chapter 4: Materials and Technologies of Chemical Production and Biomass Processing

Nanocatalysts of Sulfated Zirconia and Calcium Oxide/Zirconia for Microwave-Assisted Biodiesel Synthesis from Castor Oil R.Z. Andiena, K. Wijaya and A. Syoufian	173
Encapsulation of Lipase Enzyme in Silica Gel Matrix from Rice Husk Ash and Transesterification Reaction Activity Test on Palm Oil L.E.Y. Rahayu, D. Pranowo and T.J. Raharjo	183
Dual Function of Sugarcane Bagasse Ash in Removing Au(III) from Aqueous Solution S.J. Santosa, N. Nuryono, F.N. Aisyah and M. Hadi	190
Immobilization of Ascorbic Acid on Ni-Zn Layered Hydroxide Salts and its Application as [AuCl₄]⁻ Adsorbent M.M. Christina, B. Rusdiarso and S.J. Santosa	200
Kinetic Study of Polymerization Reaction of Bisphenol a Diglycidyl Ether and Terephthalic Acid R. Romadhona, Rochmadi, T. Ariyanto and D.T. Hartanto	208
Effect of Ethylene Glycol on Gas Permeability and Selectivity of CH₄/CO₂ Gas Separation in Zeolite/Alginate Membrane T. Suraya, R.C.M. Pratiwi and A. Suratman	214
Aluminosilicate Based Solid Acid Catalyst: Effect of Calcination Time, OH/Al Ratio and Keggin Ion Concentration on its Preparation A. Mara, R.A. Pratika, K. Wijaya, W. Trisunaryanti, M. Mudasir, H. Ismail, B. Budhijanto and A. Nadia	221
Molybdenum-Tungsten Blue Dispersions: Some Properties of the Colloid System M. Myachina, N. Gavrilova and V. Nazarov	229

Chapter 5: Materials Computational Study Based on Density Functional Theory

Interaction of C₆₀ with Small Molecules: Adsorption - Inclusion Energy Calculation Using the Density Functional Theory Y.N. Apriati, A.D. Nugraheni and S. Sholihun	237
Strain Effects on the Band Structures of Monolayer GaN from the Density Functional Theory S. Hidayati and S. Sholihun	246

Unveiling Electronic Structure and Spin-Resolve of Bulk $\text{Bi}_2\text{O}_2\text{X}$ (X = S, Se, and Te) Materials: A Computational Study Based-On Density Functional Theory
L.D. Falihin, Harsojo and M.A.U. Absor

252

Chapter 6: Materials for Sensors and Detection Technologies

Synthesis of Sodium Citrate-Capped Gold Nanoparticles and its Application for Creatinine Detection in Urine Sample by Colorimetric Analysis Based on the Red-Green-Blue (RGB) Digital Image

H. Findari, Mudasir and S.J. Santosa

261

GMR Biosensor Based on Spin-Valve Thin Films for Green-Synthesized Magnetite (Fe_3O_4) Nanoparticles Label Detection

N. Mabarroh, T. Alfansuri, N.I. Istiqomah, R.M. Tumbelaka and E. Suharyadi

270

Preliminary Research on the Analysis of Chromium(III) Based on Digital Image Processing Method Utilizing Gold Nanoparticles as Colorimetric Sensor

P.S. Dyaninggar, S.J. Santosa and B. Rusdiarso

276

Leaky Waveguide Grating (LWG) Biosensor

R. Gupta, A. Pal and N.J. Goddard

284