

# Table of Contents

## Preface

## Chapter 1: Properties of Steel and Alloys

### The Effect Addition of (Silicon and Silver) and Heat Treatments to the Alloy Properties (Copper - Nickel - Tin)

A. Dhayea Assi, Z. Thamer Abdulwahid and S. Hussein Omran 3

### The Effect of Heat Treatment for Alloys (Aluminum - Copper) on some Mechanical Properties

A. Dhayea Assi, Z. Thamer Abdulwahid and S. Hussein Omran 13

## Chapter 2: Additive Manufacturing Technologies

### Tensile Strength Evaluation of FDM 3D-Printed Polymer Using Taguchi Methodology and Range Analysis

M.T. Espino, B.J. Tuazon and J.R.C. Dizon 25

### InkJet-Printed Supercapacitor Electrodes of Graphene-Carboxymethyl Cellulose Biocomposite Ink

A.M. Bayoumy, M.A. Ibrahim, A. Osman and A. Abdelmoneim 31

### High Temperature Heat Treatment and Severe Shot Peening of PBF-LB Manufactured 316L Stainless Steel

T. Rautio, M. Jaskari, M. Hietala and A. Järvenpää 37

## Chapter 3: Materials with Magnetic and Superconducting Properties

### Magnetic Susceptibility Study of Hole-Doped Organic Metal $\kappa$ -(ET)<sub>4</sub>Hg<sub>3- $\delta$</sub> Cl<sub>8</sub>, $\delta=22\%$ and $\kappa$ -(ET)<sub>4</sub>Hg<sub>3- $\delta$</sub> Br<sub>8</sub>, $\delta=11\%$

D.P. Sari, U. Widyaiswari, Y. Someya, E. Yamada, H. Taniguchi, I. Watanabe and Y. Ishii 47

### Magnetic and Superconducting Phase Diagram of Electron-Doped $\text{Eu}_{2-x}\text{Ce}_x\text{CuO}_{4+\alpha-\delta}$

Y. Maryati, M.A. Syakuur, U. Widyaiswari, D.P. Sari, T. Saragi and R. Risdiana 53

### The Synthesis of $(1-x-y)\text{BiFeO}_3-x\text{BaTiO}_3-y\text{KVO}_3$ ( $x=0.33, 0.38, y=0.01$ ) Composition and its Effect on the Electrical Properties

F. Latief, M.A. Baqiya and S. Suasmoro 61

### Effect of Chromium Substitution on Microstructure and Magnetic Properties of $\text{La}_{0.7}\text{Sr}_{0.2}\text{Ba}_{0.1}\text{Mn}_{1-x}\text{Cr}_x\text{O}_3$ ( $x = 0, 0.03, 0.05, 0.07, 0.1$ )

D.R. Munazat, B. Kurniawan, T. Aprilianto and M. Manawan 71

### Characterization of Barium Hexaferrite ( $\text{BaFe}_{12}\text{O}_{19}$ ) from Nitrate Compound with Sol-Gel Method for Barium Hexaferrite Magnetic Materials

A.D. Shieddieque, S. Virdhian and M.I.Z. Muttahar 77

### Study of Crystal Structure and Magnetics Properties in the Normal State of Electron-Doped $\text{Eu}_{2-x}\text{Ce}_x\text{Cu}_{0.97}\text{Zn}_{0.03}\text{O}_{4+\alpha-\delta}$ in Overdoped Regime

R. Pratama, M.F. Falhan, R.S. Effendi, M.A. Syakuur, U. Widyaiswari, D.P. Sari, T. Saragi and R. Risdiana 85

### Microstructure, Magnetic and Electrical Transport Properties of Sol-Gel Synthesized $\text{La}_{0.7}\text{Sr}_{0.2}\text{Ca}_{0.1}\text{MnO}_3:\text{TiO}_2$ Composite

Z. Zulkarnain, B. Kurniawan, A. Imaduddin, H. Nugraha and D.R. Munazat 93

### Investigation of Dependence of Magnetic Properties on Sintering Temperature of $\text{Eu}_{1.85}\text{Ce}_{0.15}\text{CuO}_{4+\alpha-\delta}$ Prepared by Sol-Gel Method

M.F. Falhan, S. Winarsih, R. Pratama, M.A. Syakuur, U. Widyaiswari, A.E. Putri, T. Saragi and R. Risdiana 101

## Chapter 4: Materials for Electronics and Energy Storage

<b>Study of Zinc Oxide Films Growth on Aluminum Nitride and Silicon Substrates: Structural, Optical and Electrical Properties</b> B. Abdallah, W. Zetoun and K. Masloub	109
<b>PANI/Porous Carbon Palm Kernel Shell via <i>In Situ</i> Polymerization Method for Supercapacitor Electrode</b> J.F. Wibowo, I. Prasetyo and T. Ariyanto	123
<b>Relaxation of the Distorted Lattice of 4H-SiC (0001) Surface by Post-Oxidation Annealing</b> A.D. Hatmanto and K. Kita	131

## **Chapter 5: Physical Chemistry**

<b>Atomic Vibrational Effect on Vacancy Concentration of Gray Tin (<math>\alpha</math>-Sn): Computation Based on Density Functional Theory</b> Z.S. Fatomi, A.D. Nugraheni and S. Sholihun	139
<b>First Principle Calculations of Magnetic Proximity Effect Induced Valley Splitting on Heterointerface WS<sub>2</sub>/CoO(111)</b> A. Lukmantoro and M.A.U. Absor	147
<b>Synthesis of Reduced Graphene Oxide from Cellulose and its Applications for Methylene Blue Adsorption</b> M. Said, M. Ulfa, A. Rachmat, Desnelli and P.L. Hariani	153
<b>Modelling of Nano Silica Formation from Geothermal Silica Using Co-Precipitation Method</b> M. Syauqi, W. Astuti, S.N.A. Jennie, H.T.B.M. Petrus, V.S.H. Sujoto and P. Mulyono	171

## **Chapter 6: Materials Failure and Defects Analysis**

<b>Prediction of Wafer Handling-Induced Point Defects in 300 mm Silicon Wafer Manufacturing from Edge Geometric Data</b> H. Hu, X. Lai, M.M. Chao and K. Ullakko	181
<b>Failure Analysis of AISI H13 Shafts Used in Twin Screw Extruders during Fluoropolymer Compounding</b> V. Shrinivas and T. Arumugam	193