

# Table of Contents

## Preface

## Chapter 1: Synthesis and Analysis of Materials Properties

<b>LaFeO<sub>3</sub> Modified RuO<sub>2</sub> for Enhancing Electrochemical Performances</b> S. Li, Z.G. Zhang, X.Y. Chen and X.Y. Jiang	3
<b>Micromagnetic Modeling of Magnetite/Maghemite Particles with a Multi-Layer Core-Shelled Structure</b> K.P. Ge and W. Williams	9
<b>Synthesis of Carbon Foam Using Xanthan-Gum Additive and Characterization for its Heat Absorbing and Retarding Properties</b> S.H. Abro, H. Moria, A.Z. Al-Khazaal, U. Omer, S.M. Amin, Z.H. Minhas and S.U. Sheikh	14
<b>Study on Polarization and Adhesion Property of Gecko Inspired Mushroom-Shaped Pillars</b> M.Y. Lu, Y. Li, Q.S. He and Z.D. Dai	19

## Chapter 2: Structural Materials and Machining Technologies

<b>Design and Development of Magnetorheological Fluid Machine for Flat Surface Finish</b> O. Myataza and K. Abou-El-Hossein	27
<b>Tool Wear Progression and Optimization in End Milling of AISI 316 Stainless Steel</b> P.B. Odedeyi and K. Abou-El-Hossein	33
<b>Determining High-Temperature Oxidation Resistance of Ti-Al-Cr-Si-N Based Nitride Thin Coatings Deposited on Titanium Alloys</b> K. Savkovs and D. Andrejeva	41
<b>The Use of Additive Laser Technology for the Synthesis of Silicate Coatings in the Correction of the Shape of Precision Optical Surfaces</b> E.V. Dorofeeva, P.Y. Lobanov, I.S. Manuylovich, M.N. Meshkov and O.E. Sidoryuk	46
<b>Stress Relaxation Behavior of GH4169 Alloy</b> X.D. Lu, S.Y. Shi, B. Wen, Y.W. Zhang and J.H. Du	52
<b>Oxidation and Corrosion of Al<sub>86</sub>Ce<sub>10</sub>Fe<sub>4</sub> Metallic Glass</b> J. Zhang, J. Jia, A. Chang, T. Zhao, C. Chang and S. An	59

## Chapter 3: Biomaterials and Applied Biotechnologies

<b>Tensile Strength of Single Fiber of <i>Antheraea pernyi</i> Cocoon Prepared by Various Protocols</b> A.R. Pamungkas, T.G.T. Nindhia, I.W. Surata, T.S. Nindhia, Z. Knejzlik and T. Ruml	69
<b>Performance of Activated Carbon Made from <i>Gigantochloa verticillata</i> Bamboo for Biogas Purification</b> I.P.H. Wangsa, T.G.T. Nindhia, D.N.K.P. Negara and I.W. Surata	75
<b>Effect of Mussel Shells as a Permeable Reactive Barrier in Municipal Sewage Sludge Treatment by Electrokinetic Remediation</b> A. Ribeiro, A. Mota, J. Araújo, C. Vilarinho and J. Carvalho	81
<b>Synthesis of Calcium Phosphate Composite Bioactive Oleic Acid-Based Gels and its Application for Dentine Tubule Occlusion</b> P. Harnkla, O. Chienthavorn and K. Akkarachaneeyakorn	91

## Chapter 4: Modelling Behaviour and Numerical Analysis Properties of Building Materials and Structural Elements

<b>Simulation of Mechanical Behaviour of Materials using Constant Boundary Elements - A Discussion on the Accuracy of Results for Bars</b> P. Kirana Kumara	99
--	----

<b>Simulation of Mechanical Behaviour of Materials Using Constant Boundary Elements - A Discussion on the Accuracy of Results for Beams</b> P. Kirana Kumara	106
<b>Probabilistic Carbonation Simulations in Concrete Based on Marble Powder</b> A. Badaoui	114
<b>Studies of Bearing Elements of the Frame of Hinged Facade Systems, Taking into Account the Progressive Destruction and Temperature Effects</b> A.V. Frolovskaja, I.Y. Petukhova, N.Y. Klinduh, I.I. Terekhova and Y.M. Petrova	120
<b>Investigating States of Locally Manufactured Steel Reinforced Bars through Mechanical and Chemical Analysis</b> T. Waqar and F. Djavanroodi	125
<b>Study of Strength and Deformation Properties of the Composite Reinforcing Bar from the Continuous Basalt Fiber</b> L.Y. Stupishin, S.G. Emelyanov, E.V. Savelyeva and M.L. Moshkevich	132