

Table of Contents

Preface

Chapter 1: Heat and Mass Transfer in Engineering Systems

Finite Volume Method for Thermal Analysis of Longitudinal Trapezoidal Fin with Temperature-Dependent Thermal Conductivity and Heat Transfer Coefficient B.Y. Ogunmola and S.S. Kolajo	3
Numerical Study of Natural Convection in a Square Cavity Filled with Nanofluid I. Lahlal, H. Talbi, K. Amghar, S. Daoudi and M. Alla	15
Numerical Investigation of Laminar Flow and Heat Transfer in a Bifurcated Backwards-Facing Step in the Presence of an Elastic Fin M. Benyahia, F. Bouzit, A. Mokhefi and M. Bouzit	27
Analytical and Numerical Analyses of MHD Non-Newtonian Third-Grade Nanofluid in Couette and Poiseuille Flows Using AGM K. Azri, M. Mecili and E.H. Mezaache	57

Chapter 2: Heat Treatment of Metals

Effect of Heat Treatment on Microstructure, Phase Composition and Mechanical Properties of Low-Cost Titanium Alloy Ti-2.8Al-5.1Mo-4.9Fe Obtained by TIG Welding S.V. Akhonin, V.Y. Belous and R.V. Selin	85
The Effect of Flame Straightening Thermal Cycles on S1100M Properties M. Gáspár, S. Alden Abd Al Al, M. Török and L. Gyura	93
Experimental Research Concerning Structural and Hardness Stability of 100Cr6 Steel Parts D.M. Duma, S. Duma, I. Duma and D. Buzdugan	103

Chapter 3: Tribological Research

Finite Element Analysis of Failure Pressure of X60 Pipeline with Double Defect W.L. Duan, Z.H. Wang, D.Z. Li, M.Z. Long, X.J. Li and Z.F. Zhang	113
Investigation of the Impact of Groove Angle on the Fatigue Life of Grooved Brake Discs Z.H. Sha, Y. Xie, Z.Y. Han, J.A. Yin, L. Shi, H.X. Gao and Y. Liu	133

Chapter 4: Materials for Energy Storage Devices

Wet Spinning of Optimized Graphene Oxide Nanosheets for Enhanced Electrochemical Performance in Fiber-Based Supercapacitors C.C. Muhuwa, M.M. Mohamed, M. Ulbricht and A.S.G. Khalil	151
Electrochemical Performance of Hydrothermal Synthesized Fe₃O₄/ReS₂ Heterostructure for Supercapacitor Electrodes M.A.A. Eldaly, M.A. Hassan, G. Guan and A.S.G. Khalil	157
Significant Study on LIG Supercapacitor Electrode Performance in Different Aqueous Electrolytes S.A. Mensah, A.M.R.F. El-Bab, Y. Tominaga and A.S.G. Khalil	165
High-Energy-Density TiO₂-Coated LiNi_{0.9}Mn_{0.05}Co_{0.05}O₂ (NMC 955) as Cathode for Lithium-Ion Batteries S. Abdul Hadi, D. Susanti and L. Noerochim	171
Grey Sedge as Potential Source for Biomass-Derived SiO_x/C Anode in Lithium-Ion Battery M.H.R. Pasha, Q. Aini, P.M. Nasution, A.R. Setiawan and A. Sumboja	177
The Impact of Varying Radiation Duration in Microwave-Assisted Solvothermal Process on the Capacitive Properties of N-Doped rGO/CuCr₂O₄ Composites D. Susanti, I.M.K. Pramananda, H. Nurdiansah, Y.W. Rakhmawati and G.E. Kusuma	185