

Table of Contents

Preface and Committees

Random Walk

J.N. Mundy 1

Analysis of Laser Weldments for Dual-Phase and Martensitic Steel Sheets for Automotive Applications

Y.N. Ahn, M.J. Kang and C.H. Kim 8

Infrared Monitoring of Inner Defects in Glass Laminates

I. Kopal, P. Košťial, I. Špička, Z. Jančíková, J. Müllerová, M. Harničarová, J. Valíček and V. Rusnák 13

Experimental Study of Micro-Cracks in Laboratory and *In Situ* Using Infrared Thermography

E. Barreira, S.S. de Freitas, V.P. de Freitas and J.M.P.Q. Delgado 17

Sensibility Analysis of the Parameters Affecting Infrared Thermal Images for the Evaluation of Building Pathologies

E. Barreira, S.S. de Freitas, V.P. de Freitas and J.M.P.Q. Delgado 23

Comparison of Performance and Emission Parameters in Two Developmental Stages of Boilers

J. Müllerová, J. Valíček and M. Harničarová 28

Studies on the Treatment of Wastewaters Containing Cr⁶⁺ with Iron Oxide-Silica Composite Materials Prepared by Different Methods

R. Ullah, B.K. Deb and M.Y.A. Mollah 33

Application of Calcium Carbonate in Resin Transfer Molding Process

I. Rodrigues, S.C. Amico, R. Barcella and A.G.B. de Lima 39

Resin Transfer Molding Process: A Numerical Analysis

I. Rodrigues, S.C. Amico, J.A. Souza and A.G.B. de Lima 44

Methane Diffusion in a Porous Environment

P. Staša, V. Kohut, O. Kodym and Z. Jančíková 50

Visualization of Thermal Measuring in 3D Environment

O. Kodym, V. Kohut, P. Košťial and Z. Jančíková 56

Diffusion Induced Changes in Eutectic Carbides in Inoculated M2 High-Speed Steel at Austenitising

A.S. Chaus, M. Beznák, R. Šuba and M. Bajčičák 61

Modelling and Simulation of Resin Transfer Moulding: A Finite Volume Approach Applied to the Mold Filling Stage

B.G. Coutinho, V.M.F. Bezerra, S.R. de Farias Neto and A.G.B. de Lima 67

Design and Analysis of Concentrated Solar-Energy Assisted Paddle Dryers

J.Y. Du, X.Z. Liu and H.L. Zhang 73

A Study on Processing and Chemical Composition of Date Pit Powder for Application in Enhanced Oil Recovery

J.K. Adewole and A.S. Sultan 79

Water Absorption in Composites Reinforced with Caroá Fiber Fabrics: Modeling and Simulation via ANSYS CFX®

C.J. Silva, T.H.F. de Andrade, E.G. Silva and A.G.B. de Lima 84

Characterization of Gamma Irradiated PP/LDPE Blend

T.M. Moori, M.C. Terence, N.C. Pereira, S.B. Faldini and L.F. de Miranda 90

Experimental Investigation on Flame Propagation Speed of Rice Husk Ash in Fixed Beds

C. Huang, Y.M. Zhu, H.L. Zhang and X.Z. Liu 96

Compressive Aggregates of Two-Dimensional Mono-Disperse to Assess Flaw Dissemination

S. Promkotra 101

Interactive Force of Two-Dimensional Compressive Deformation by Discrete Element Method (DEM)

S. Promkotra and T. Kangsadan 106

Thermodynamic Simulation of the Oxidation Processes of Ag₂Se by NaNO₂

O.V. Nechvoglod, E.N. Selivanov, V. Chumarev and D. Toloknov 111

Drying of Industrial Ceramic Bricks: An Experimental Investigation in Oven	
G.S. Almeida, M.A.F.B. Fernandes, J.N.F. Fernandes, G.A. Neves, W.M.P.B. de Lima and A.G.B. de Lima	116
Estimation of a Nusselt Correlation for the Numerical Prediction of Frost Thickness on a Tube Banks of Triangular Arrangement	
R. da Cunha Ribeiro da Silva, C.T. Salinas, P.A. Delgado and K.A.R. Ismail	121
Mathematical Modeling of High Energy Ball Milling (HEBM) Process	
M. Radune, A. Radune, S. Lugovskoy, M. Zinigrad, D. Fuks and N. Frage	126
In Situ Optical Analysis of Structural Changes in Polylactic Acid (PLA) during the Gas Dissolution Process	
B. Notario, J. Pinto, E. Solórzano, J. Escudero, J.M. de León, D. Velasco and M.A. Rodríguez-Pérez	131
Thermal Expansion of Cu-Ga-Sn Alloys	
V.A. Bykov, T.V. Kulikova, K.Y. Shunyaev and A.B. Shubin	137
Fabrication and Characterization of CeO₂-NiO/SiC Membranes for Hydrogen Permeation	
J.H. Park and M.W. Jung	143
Radiation Damaging of 3C-SiC Lattice: Computer Simulation of Brownian Motion of Non-Point Defects	
G.I. Zmievskaya, A.L. Bondareva and V.V. Savchenko	148
Improving the Diffusion Controlled Cementation of Copper Ions on a Fixed Bed of Zinc Raschig Rings Using Flow Pulses in a Batch Reactor	
A.H. El-Shazly, A.A. Mubarak and H.S. Bamfleth	153
Effect of Hydrogen on the Mechanical Behavior of API X70 Ageing	
M.A.D. Ruiz, N.L. Perrusquia, J.A.O. Herrera, G.U. Calderón, V.J.C. Suárez and S.R. Gonzales	159
Study of Hydrogen Permeation in a Micro-Alloyed Heat Treated Steel	
N. Lopez-Perrusquia, M.A. Doñu-Ruiz, J.A. Ortega-Herrera, G. Urriolagoitia-Calderón and Y.E. Vargas-Oliva	165
Physical Chemistry of Integrated High-Magnesia Siderites Processing	
V. Kolokoltsev, S. Klochkovskii and A. Smirnov	171
Concentration Dependence of the Diffusion in the Ni/Cu System	
Z. Balogh, M.R. Chellali, P. Stender and G. Schmitz	177
Annealing Effects in Mg-Y-Zn Alloys Prepared by Powder Metallurgy and by Squeeze Casting	
T. Kekule, M. Vlach, H. Kudrnová, V. Kodetova, B. Smola and I. Stulíková	183
Determination of Poroelastic Parameters of Porous Building Materials	
J. Lukovičová, G. Pavlendová, I. Baník and R. Podoba	189
Comparative Study of CO₂ Absorption in Aqueous Mixtures of Methyldiethanolamine (MDEA) and Methanol, Focusing on the Temperature and Concentration Influence over the Absorption Rate	
F.J. Tamajón, E. Álvarez, F. Cerdeira and M.E. Vázquez	193
Evaluation of Rubidium and Potassium Diffusion in Soil by Radiotracer Technique	
E. Demir, A.B. Tugrul, N. Baydogan, A.F. Baytaş, N. Altinsoy, S. Haciyakupoğlu and B. Büyükkılıç	199
Irradiation Effect on Ta₂O₅ Thin Films	
N. Baydogan, B. Erkan, A.B. Tugrul and H. Çimenoğlu	205
Effect of Voltage Parameters on Surface Morphology of Micro Arc Oxidized Cp Titanium	
S.K. Yazici, F. Muhaffel and M. Baydogan	211
Micro Arc Oxidation of AZ91 Magnesium Alloy – Effect of Organic Compounds in the Electrolyte	
N.K. Gozuacik, M. Altay and M. Baydogan	217
Nitrogen Diffusion in Niobium under Low Pressure	
A.C. Souza, O. Florêncio and C.R. Grandini	223
Microstructure of Sodium or Potassium Added Mg-Ni Eutectic Alloy	
H. Saitoh and Y. Shiraishi	228
Characterization of LSCO BCZY LSCO for Potential Application in IT-SOFC	
A.A. Samat, M.A. Mohd Ishak and N. Osman	233
Effect of Silicon Particle Size on Synthesis and Crystallinity of β-Silicon Carbide Particles	
W.T. Kwon, S.R. Kim, Y.H. Kim, Y.J. Lee, J.Y. Won and S.C. Oh	239

The Synthesis of High-Surface Area Silicon Carbide by Conversion Method Using Carbosilane Polymer	244
E.J. Jung, Y.J. Lee, W.T. Kwon, Y. Kim, D.G. Shin and S.R. Kim	
Effect of Hard Coatings on Surface Gray Iron on Fracture Toughness	248
L.D.R. Cruz, M.A. Doñu-Ruiz, N.L. Perrusquia, V.J. Cortés Suárez, C.R. Torres San Miguel and T. de la Mora Ramírez	
Effect of Heat Treatment on Microstructure and Mechanical Property of Diamonds Substrates Brazed with Active Filler Metal	254
F.R. Francisco, J.R. Moro, E.J. Corat, R.A. Campos and O.R. Bagnato	
Effect of Intermetallics on Pt-Al Surface Coatings Colour	259
M. Topic, R.P. Vinci, Z. Khumalo and C. Mtshali	
Phase Transformation in Granular Alloys of Cu₂S-Ni₃S₂-Na₂S System	263
E.N. Selivanov, L.Y. Udoeva and N.I. Selmenskikh	
Phase Growth in Amorphous Si-Cu and Si-Co Systems: Combination of SNMS, XPS, XRD, and APT Techniques	269
B. Parditka, M. Verezhak and M. Ibrahim	
Elastic Deformation Effects on the Thermo-Hydrodynamic Aspect of Porous Journal Bearings	275
S. Boubendir, S. Larbi and R. Bennacer	
Determination of Sorption Isotherm Based on the Measured Bottom Contaminant Flux	280
J. Minár and J. Kačur	
A Mechano-Chemical Coupling for Hydrogen Diffusion in Metals Based on a Thermodynamic Approach	286
N. Creton, S. Dejardin, B. Grysakowski, V. Optasanu and T. Montesin	
Self-Diffusion on Pd(111) from the Point of View of the Band Model of Diffusion	292
I. Baník, J. Lukovičová and G. Pavlendová	
The Convergence Rate of Iterative Procedures for Elliptic Problems in Heterogeneous Media	298
A.S. Francisco, H.P.A. Souto and T.J. Pereira	
Mass Transfer around a Sphere Buried in a Packed Bed	306
J.M.P.Q. Delgado and M. Vázquez da Silva	
Rising Damp: Optimization of the Wall Base Ventilation System	311
A.S. Guimarães, J.M.P.Q. Delgado and V.P. de Freitas	