

Table of Contents

Preface

Chapter 1: Nanomaterials for Energy and Sustainability

Self-Propagation Low Temperature Flameless Combustion Synthesis of Ni and Al Nanoparticles: Time-Resolved XRD Study

Y.M. Mikhailov, V.V. Aleshin, A.M. Kolesnikova, D.Y. Kovalev and V.I. Ponomarev 1

Compositional Designs for High Performance Antifingerprint Coated Concealed Cistern Control Panels

A. Tunalı and N. Tamsu Selli 7

Sol-Gel Derived Two-Dimensional Nanostructures of Calcium Phosphates

A. Prichodko, V. Jonauskė, M. Cepenko, A. Beganskiene and A. Kareiva 13

Study on the Synthesis of Batches of the System Y-Ba-Cu-O Using Sol-Gel Method

P. Pashev, R. Raykova, Y. Hristov and B. Bogdanov 19

Consolidated Nanocomposite Materials with the Defined Properties

G.D. Semchenko and E.S. Gevorkyan 24

Hydrogen Production from Thermochemical Water-Splitting Using Ferrites Prepared by Solution Combustion Synthesis

I. Walters, R. Shende and J.A. Puszynski 32

Self-Cleaning and Anti-Fogging Surfaces Based on Nanostructured Metal Oxides

U. Lavrenčič Stangar, M. Tasbihi, F. Fresno, M. Kete, A. Gasparotto, C. Maccato and D. Barreca 39

Chapter 2: Porous Ceramics

Fabricating of Diatomite Based Ceramic Water Filter by a Novel Casting Method

U.E. Anil, E. Al, K. Kayaci and F. Kara 48

Characterization of Aerogels – Challenges and Prospects

G. Reichenauer 54

Evaluating Porosity in Cordierite Diesel Particulate Filter Materials: Advanced X-Ray Techniques and New Statistical Analysis Methods

A. Kupsch, A. Lange, M.P. Hentschel, Y. Onel, T. Wolk, A. Staude, K. Ehrig, B.R. Müller and G. Bruno 64

Modeling the Properties of Cellular Ceramics: From Foams to Lattices and Back to Foams

A. Ortona and E. Rezaei 70

Porous Silicas for Enhanced Drug Release

A.M. Crean, R.J. Ahern, R. Dontireddy, W. Faisil, J.P. Hanrahan, B.T. Griffin and K.B. Ryan 79

Lightweight Bi-Layered Ceramic Tiles for Novel Applications

R.M. Novais, M.P. Seabra and J.A. Labrincha 82

Porous Clay Ceramic for Environmental Technologies

R. Švinka, V. Svinka, L. Dabare and O. Lescinskis 88

Al₂O₃ Preforms with Gradient Porosity for Brake Disk Application

A. Strojny-Nedza, K. Pietrzak, M. Chmielewski and K. Jach 94

Chapter 3: Ceramic Thin Films and Coatings

Relationship between Residual Stresses and Damaging in Thermally Grown Oxide on Metals: Raman Spectroscopy and Synchrotron Micro-Diffraction Contributions

J.L. Grosseau-Poussard, M. Guérain, P. Goudeau, G. Geandier, B. Panicaud, N. Tamura, M. Kunz, C. Dejoie and J.S. Micha 100

Influence of Application Technology in the Structural Characteristics of Ceramic Coatings with Advanced Anticorrosive and Tribological Properties

D. Vélez, J. Muñoz and J.A. Díez 108

Amorphous Alumina Coatings on Glass Bottles Using Direct Liquid Injection MOCVD for Packaging Applications

P.L. Etchepare, H. Vergnes, D. Samélor, D. Sadowski, C. Brasme, B. Caussat and C. Vahlas 117

Temperature Dependent 4-, 5- and 6-Fold Coordination of Aluminum in MOCVD-Grown Amorphous Alumina Films: From Local Coordination to Material Properties	
A.N. Gleizes, D. Samélor, C. Vahlas, V. Sarou-Kanian, P. Florian and D. Massiot	123
Comparison of the Ablation Mechanism of C/C-SiC Composite under Atmospheric and Low Pressure	
R.J. Silva, H.S. Maciel, A.M. Essiptchouk and G. Petraconi	134
Oxide Films Formed on FeCrAl Steel Foil Coated with Pt and Al Films	
K. Reszka, Z. Zurek, M. Szczypinski and A. Jaron	140