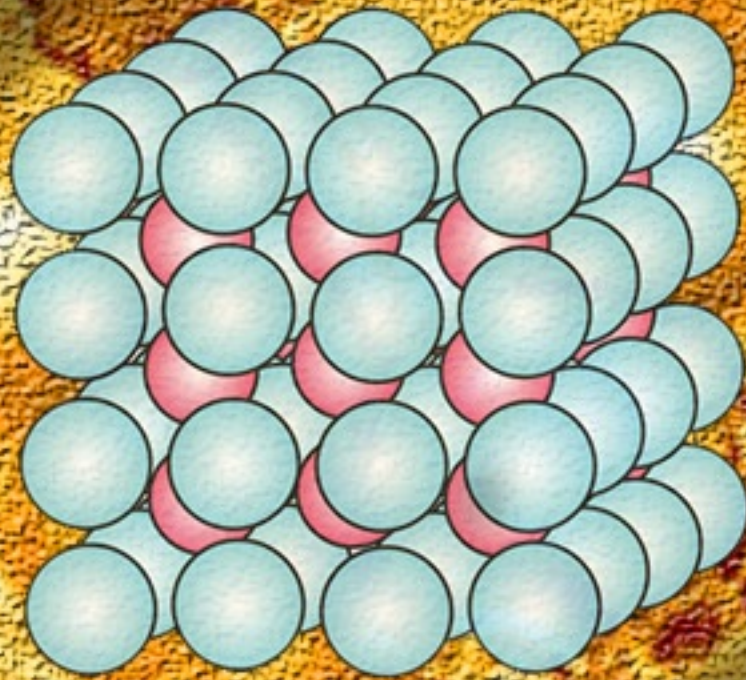


INTERNATIONAL SCIENTIFIC JOURNAL

"MATERIAL SCIENCE"



„NONEQUILIBRIUM PHASE TRANSFORMATIONS“

YEAR IV, ISSUE 4/2018

ISSN PRINT 2367-749X

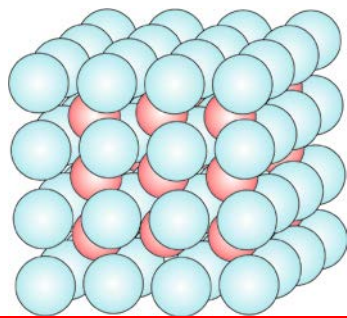
ISSN WEB 2534-8477

PUBLISHER: SCIENTIFIC TECHNICAL UNION OF MECHANICAL ENGINEERING
INDUSTRY 4.0

108 Rakovski str., 1000 Sofia, Bulgaria

tel./fax (+359 2) 986 22 40, tel. (+359 2) 987 72 90,

office@stumejournals.com, www.stumejournals.com



INTERNATIONAL SCIENTIFIC JOURNAL MATERIALS SCIENCE. NON-EQUILIBRIUM PHASE TRANSFORMATIONS

PUBLISHER:

**SCIENTIFIC TECHNICAL UNION OF MECHANICAL ENGINEERING
"INDUSTRY 4.0"**

108, Rakovski Str., 1000 Sofia, Bulgaria

tel. (+359 2) 987 72 90,

tel./fax (+359 2) 986 22 40,

office@stumejournals.com

**ISSN PRINT 2367-749X, ISSN WEB 2534-8477
YEAR IV, ISSUE 4/ 2018**

EDITORIAL BOARD

CHIEF EDITOR

Prof. Dimitar Stavrev – Bulgaria

DEPUTY EDITOR:

Dr. Alexander Krugljakow, Germany

Prof. Sergey Dobatkin, Russia

Prof. Sergey Nikulin, Russia

Prof. Victor Anchev, Bulgaria

RESPONSIBLE SECRETARY:

Assoc. Prof. Tsanka Dikova, Bulgaria

MEMBERS:

Prof. Adel Mahmud, Iraq
Prof. Anna Proikova, Bulgaria
Prof. Bekir Sami Yilbas, Saudi Arabia
Prof. Dermot Brabazon, Ireland
Prof. Dipten Misra, India
Assoc. Prof. Eugeny Grigoriev, Russia
Prof. F. W. Travis, United Kingdom
Prof. Gennagiy Bagluk, Ukraine
Assoc. Prof. Ibrahim E. Saklakoglu, Turkey
Prof. Iis Sopyan, Malaysia
Prof. Ivan Parshorov, Bulgaria
Prof. Ivanja Markova, Bulgaria
Prof. Janez Grum, Slovenia
Prof. Jens Bergstrom, Sweden
Prof. Leszek Dobrzanski, Poland

Prof. Ludmila Kaputkina, Russia
Prof. Nikolai Dulgerov, Bulgaria
Prof. Omer Keles, Turkey
Prof. Plamen Danev, Bulgaria
Prof. Rui Vilar, Portugal
Prof. Rusko Shishkov, Bulgaria
Prof. Saleem Hashmi, Ireland
Dr. Sefika Kasman, Turkey
Prof. Seiji Katayama, Japan
Prof. Souren Mitra, India
Dr. Sumsun Naher, United Kingdom
Prof. Svetlana Gubenko, Ukraine
Prof. Sveto Cvetkovski, Macedonia
Prof. Ventsislav Toshkov, Bulgaria
Prof. Yovka Dragieva, Bulgaria

CONTENTS

MATHEMATICAL MODELING OF TWO-PHASE ZONE ORIGINATION IN DIRECTIONAL CRYSTALLIZATION PROCESSES

D.V. Alexandrov, I.V. Alexandrova, A.A. Ivanov, I.G. Nizovtseva, O.V. Gusakova, L.V. Toropova, E.A. Titova 105

THE INFLUNCE OF NETWORK IMPERFECTIONS ON THE MECHANICAL PROPERTIES OF ELASTOMERS WITH ISOCYANURATE RINGS

Prof. Budinski-Simendić J. PhD, Prof. Ivan Krakovsky PhD, M.Sc. Erceg T., Prof. Simendić B. PhD3, Špirkova M. PhD, Prof. Pavličević J. PhD, Šomvarsky J. PhD 108

THE INFLUENCE OF THE NANOSTRUCTURE CHANGES ON THE STRENGTH PROPERTIES OF MATERIALS

D.E. Kaminski V., PhD Sharenkova N. 112

MODIFYING OF ALUMINUM ALLOY AISi7Mg WITH NANOCOMPOSITIONS

Senior Assist. Prof. Velikov A., PhD, Senior Assist. Prof. Kuzmanov P., PhD, Senior Assist. Prof. Gradinarov D. , PhD, Senior Assist. Prof. Krustev B., PhD, Senior Assist. Prof. Dimitrova R., PhD and Assoc. Prof. Manolov V., PhD. 114

TRIBOTECHNICAL CHARACTERISTICS OF COMPOSITE COATINGS BASED ON ZIRCONIUM CARBONITRIDE SUBJECTED TO CRYOGENIC TREATMENT

Ass.prof, dr.Eng. Auchynnikau Y.V., Phd Chekan N.M., Phd Akula I.P., Ass.prof. Phd Eisymont Y.I. 118

MODELLING AND FINITE ELEMENT ANALYSIS OF TENSILE TESTING FOR THE COATED SPECIMENS

Assoc. Prof. N.A. Dolgov, Prof. N. Tonchev 112

EFFECT OF PRINTING PARAMETERS ON MECHANICAL PROPERTIES OF 3D PRINTED PLA/CARBON FIBRE COMPOSITES

Kovan V., Tezel T., Camurlu H.E., Topal E.S. 126

NUMERICAL MODELLING OF FLOWS ALONG THE NANOSTRUCTURED SURFACE

Mg.Sc.Ing. Zaimis U., Prof. Dr.Sc.Math. Guseynov Sh.E., Prof.Dr.Sc.Comp. Jansone A., Assist.Prof.Dr.biol. Jurmalietis R. 129

MICROSTRUCTURE AND MECHANICAL PROPERTIES OF P/M TITANIUM MATRIX COMPOSITES REINFORCED WITH TiB

Prof., Dr. Sc. Bagliuk G., M. Sc. Stasiuk O. 133

ION PLAZMA NITRIDING OF FERRITIC STEEL AISI 430 F

MSc Naziv Jashari, Prof. Dr Cvetkovski. S. PhD., Prof. Dr Ş. Hakan Atapek PhD., Prof. Dr Şeyda Polat PhD., Dr Gülşah Aktaş Çelik 138

SOLIDIFICATION IN SMALL VOLUME

Assoc. Prof. Bushev St., PhD. Eng. 142