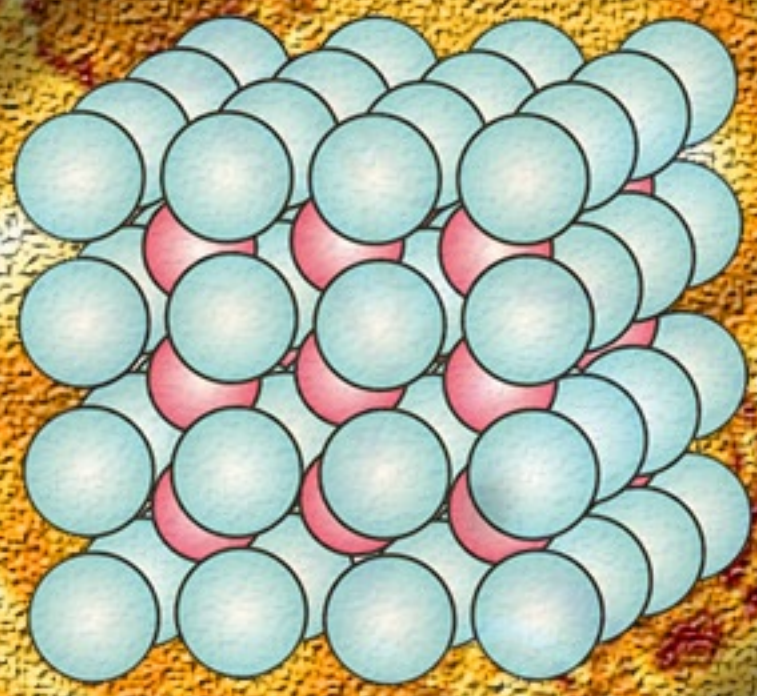
INTERNATIONAL SCIENTIFIC JOURNAL

"MATERIAL SCIENCE"



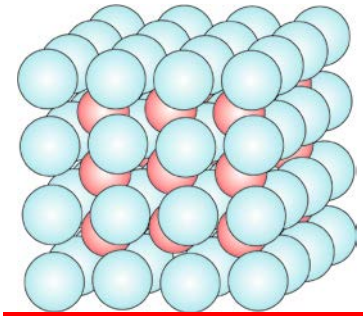
„NONEQUILIBRIUM PHASE TRANSFORMATIONS"

YEAR V, ISSUE 1/2019

ISSN PRINT 2367-749X
ISSN WEB 2534-8477

PUBLISHER: SCIENTICIC 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 V, ISSUE 1/ 2019

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.Eugeniy 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

C O N T E N T S

GREEN CHEMISTRY: CARBON-BEARING MINERALS AS A SOURCE OF NANOCARBONS
Prof. Huczko A., Dr Dąbrowska A., Dr Fronczak M., Dr Strachowski P., Sokołowski S., Prof. Bystrzejewski M., Prof. Subedi D.P., Dr Kafle B.P. 3

INCREASE IN STRENGTH PROPERTIES OF LOW-CARBON STEELS DUE TO STRUCTURAL TRANSFORMATIONS AT DEFORMATION BY ROTARY SWAGING
Prof., Dr.Sci. Dobatkin S.V. Dr. Rybalchenko O.V., Tokar A.A., Prof., Dr.Sci. Odessky P.D., Lunev V.A., Morozov M.M., Dr.Sci. Yusupov V.S. 8

FEATURES OF STRUCTURE FORMATION AND MECHANICAL BEHAVIOR OF METALLIC MATERIALS UNDER CONDITIONS OF APPLICATION OF GRADIENT DEFORMATIONS
A.G. Raab - Ph.D., A.P. Zhilyaev– Dr. Sci, I.S.Kodirov, G.N. Aleshin - Ph.D. 11

THE INFLUENCE OF HEAT TREATMENT ON PROPERTIES OF STEEL FOR CEMENTATION
Opačak I., mag.ing.mech., Prof. dr. sc. Marušić V., Hon.D.Sc. Dašić P., Opačak I., dipl.ing.stroj. 13

CORROSION STABILITY IN SALT MEDIUM OF STAINLESS STEEL AND CARBON STEEL, USING DIFFERENT OXIDE SOL GEL COATINGS
Chief Assist. Prof. Dr. St. Yordanov, Assoc. Prof. Dr. I. Stambolova, Prof. Dr. L. Lakov, Prof. Dr. S. Vassilev, Assoc. Prof. Dr. B. Jivov, Chief Assist. Dr. A. Nedelcheva-Bachvarova 16

COMPARATIVE TRIBOLOGICAL PROPERTIES OF AZ91D MAGNESIUM ALLOY AFTER STRENGTHENING BY SiC POWDER AND AFTER SEVERE PLASTIC DEFORMATION
Lead. Res., Dr. Semenov V. I., Prof., Dr. Lin H.-C., Prof. Shuster L.Sh., Prof. N. Tontchev, Prof., Dr. Chun Chiu, Prof., Dr. Huang S.-J. 19

INFLUENCE OF THE SYNTHESIS METHOD ON THE CRYSTALLINE STRUCTURE, PHASE COMPOSITION AND PROPERTIES OF TiCrFeNiCuC EQUIATOMIC ALLOYS
M.Sc. Marych M., Mamonova A., PhD., Prof. Bagliuk G., Dr. Sc. 23

SURFACE TREATMENTS AND COATINGS APPLICATION ON THE ALUMINUM PRODUCTS
PhD. Markja I., PhD. Dhoska K., Prof. As. Elezi D. 26

EVALUATION OF MECHANICAL PROPERTIES OF DUCTILE CAST IRON AND INVERSE REGRESSION
Assoc. Prof, PhD. Alexander Popov, PhD. Mr. Eng. Jan Ivanov , Br. Eng. Stefan Georgiev 28