Table of Contents

Preface, Conference Committee, Sponsors

Chapter 1: New Functional and Structural Materials and Processing Technologies

Physical-Chemical Properties of Molybdenum Films Prepared with Magnetron Sputtering
N.A. Shaburova, T.D. Ratmanov and A.M. Minkin

Optimization of Synthesis Mode for Hydro Silicate-Based Supplements Used for Lime Dry Construction Mixtures
V.I. Loganina and I.S. Pyshkina

Current State and Future Prospects for Improvement of Mineral Melt Production Technologies
V.I. Matyukhin, V.A. Dudko and N.V. Grebneva

The Wear Resistance of Mottled Iron with Stabilized Carbide Phase
S.V. Davydov and A.O. Gorlenko

Research of Activity of Natural Radionuclides in Construction Raw Materials of the Volgograd Region
I.P. Mikhnev, N.A. Salnikova and M.B. Lempert

Sulfur Composite Materials Based on Sulfide Containing Industrial Waste
A.A. Yusupova, R.T. Akhmetova and L.N. Shafigullin

Environmental and Technical Possibilities of Marble Waste Recycling in Bricks and Sorbents Production
D.V. Oreshkin and V.A.Perfilov

Improvement of Environmental Safety due to Utilization of Industrial Wastes in Refractory Concretes Production
V.A.Perfilov and D.V. Oreshkin

Multi-Layer Wood-Polymer Composite
D.V. Tuncev, Z.G. Sattarova and I.M. Galiev

Study of Residual Stresses and Surface Hardening in Tubes for Nuclear Steam Generators
M.A. Rozenbaum, A.V. Serebryakov, I. Bazhukov and G.V. Shimov

Multifractal Parametrization of Welded Joints Structure as an Instrument of Diagnostics and Detection of Defects
E.V. Poyarkova and I.R. Kuzeev

Assessment of Welded Joints Structure Defectiveness Based on the Presence of Non-Metallic Inclusions
E.V. Poyarkova, I.R. Kuzeev and K.L. Zabelin

Pulse Processing of Molten Metals
V.V. Krymsky, V.F. Balakirev and N.A. Shaburova

Choice of Laser Cementsation Method of Blade Woodcutting Tools
E. Marinin, A. Chirkov and G. Gavrilov

Bolts Manufacturing Technology
E.S. Reshetnikova, D.U. Usaty and T.V. Usataya

Strengthening Mini Silo Construction Made of Reinforced Concrete Blocks with Carbon Fiber Lamellae
I.A. Mayatskaya, A.E. Fedchenko and D.S. Zagutin

Strengthening Building Structures with Polymer Composite Materials
I.A. Mayatskaya, A.E. Fedchenko and D.B. Demchenko

Influence of Concrete Mix Transportation with Inertia Conveyor on Concrete Properties
S.G. Osmanov

Structure and Properties of Concrete for Injection with Two-Stage Expansion
Y.I. Koryanova

On Effect of Superplasticizers and Mineral Additives on Creep Factor of Hardened Cement Paste and Concrete
G.V. Nesvetaev, I.V. Korchagin and Y.Y. Lopatina
Study of Carbon Fiber Materials Sorption Capacity to Remove Heavy Metal Ions and Oil Products from Wastewater during its Treatment
A.I. Syutova, S.Y. Alibekov and N.P. Syutov

Study of Compression Soft Porous Foam Materials
I. Cherunova, N. Kornev and M. Paschen

Technological Increase of Adhesion Strength between Antifriction Coating and Base in Bimetal Fluid-Film Bearings
A.Y. Rodichev, A.V. Sytin and V.V. Barabash

Technology of Mineral Raw Materials Granulation by Electric Arc for Manufacturing of Welding Fused Flux
S.V. Naumov, M.N. Ignatov and M.A. Sheksheev

Use of Low-Grade Vegetable Raw Materials in Production of Composites by Preliminary Processing
R.R. Khasanshin, R.R. Safin and N.R. Galyavetdinov

Polymer-Bitumen Binder Based Multifunctional Material
S.G. Abramyan and O.V. Oganesyan

Properties of Elastomeric Adhesive Composition Based on Chlorinated Isobutylene Isoprene Rubber Obtained by Mechanochemical Halide Modification
K.V. Sukhareva, I.A. Mikhailov and E.E. Mastalygina

Calculation of Joint Plastic Deformation to Form Metal Compound in Cold Condition
A.V. Shaparev and I.A. Savin

Carbogenic and Mineral Adsorbent, Produced of Slurry Withdrawal of Oil-Extracting Production
I.V. Starostina, D.V. Stolyarov and M.M. Kosukhin

Cold Spray Repairing Corrosively Damaged Areas on Aircraft Constructions
V.S. Shikhanov, N.S. Ryashin and A.V. Lapaev

Colloid-Chemical Bases on Creation of Multifunctional Modifiers of Concrete Mix and Concrete
M.M. Kosukhin, N.A. Shapovalov and A.M. Kosukhin

Combined Influence of Opoka and Slag on Cement Properties in Presence of Superplasticizer
M.O. Korovkin and N.A. Eroshkina

Creating Carbon Nanotubes Microenvironment in Surfactant Water Solutions
O.S. Zueva, A.O. Makarova and D.A. Faizullin

Examining the Microstructure of Industrial Leaded Brass Blanks for Quality Control
G.A. Tkachuk, V.V. Shimov and O.A. Chikova

Extension of Raw Material Base for Ceramic Building Bricks Production
N.S. Lupandina, N.Y. Kiryushina and E.V. Porozhnuyk

Improving Masonry and Protective Paints Quality
A.V. Vyboishchik and I.L. Kostiunina

Improving the Reliability of Shell Structures Made of Composite Nanomaterials
T.P. Kasharina

Ion Implantation Modification of Surfaces
V.N. Zlobin, L.R. Kushch and A.S. Kudashev

Nano Additives Influence on Fuel Oil Properties
E.R. Zvereva, R.V. Khabibullina and O.S. Zueva

Research of Efficient Methods of Superplasticizer Introduction into Cement Materials
M.O. Korovkin and D.M. Grintsov

Research of Materials for High Temperature Electromechanical Energy Converter
F.R. Ismagilov, V.E. Vavilov, A.K. Miniyarov and A.A. Mednov

Simple Universal Kelvin Equation Valid in Critical Point Vicinity and its Application to Carbon Dioxide Capillary Condensation in Mesoporous Silica
A.A. Valeev and E.V. Morozova

Study and Analysis of Aluminate Dry Construction Mixtures Properties
V.A. Belyakov and I.A. Bannikova

Chemical Aspects of the Obtaining of Iron-Containing Coagulant-Flocculant from Electric Steel Melting Slag for Wastewater Treatment
T.A. Vasilenko and A.A. Koltun
Functional Nanostructured Tribotechnical Materials
L.B. Leont'ev, N.P. Shapkin and V.N. Makarov 410

Research on Influence of Technology of Bimetal Fluid-Film Bearing Manufacturing on Microstructure and Microhardness of Antifriction Coating and Steel Base
A.Y. Rodichev, A.V. Sytin and V.O. Tyurin 416

Study of Physical and Mechanical Properties of Non-Polar Rubber-Based Sealants Depending on Filler Type and Volume
V.D. Cherkasov, Y.V. Yurkin and V.V. Avdonin 422

Study the Effect of Heavy Elements Nanoparticles in the Photons Energy Spectrum in a Tissue-Equivalent Medium
V.V. Temchenko, V.N. Kustov and K.S. Lukyanenko 428

The Production and Subsequent Selective Laser Melting of AlSi12 Powder
P.A. Lykov, A.O. Shults and K.A. Bromer 434

Theoretical and Experimental Investigation of Vibration Damping Sheet Dynamic Behavior
V.D. Cherkasov, Y.V. Yurkin and V.V. Avdonin 439

Using Mathematical Modeling to Develop Electrode Coating Composition for Stable Arcing and Arc Restarting
I.Y. Letyagin 445

Combined Extender Pigments Based on Industrial Wastes
Z.A. Sapronova, D.V. Sapronov and Y.L. Starostina 450

Influence of Al-Cu-Mn-Fe-Ti Alloy Composition and Production Parameters of Extruded Semi-Finished Products on their Structure and Mechanical Properties
P.L. Reznik and M. Lobanov 456

Influence of Gas Shielding Method in Welding with Consumable Electrode on Heat Distribution in a Welded Product
D.A. Chinakhov, E.G. Grigorieva and E.I. Mayorova 463

Influence of Selective Laser Melting Process Parameters on Porosity of TiAl6V4 Alloy Fabricated by 200W CO2 Laser
R.M. Baitimerov, L.V. Radionova and E.V. Safonov 470

Investigation of Ba-Fe-O System near the BaFe12O19
D.A. Vinnik, E.A. Trofimov and D.A. Zherebtsov 475

P.A. Lykov, D.A. Zherebtsov and S.V. Nerush 481

Effect of Heat Treatment on Change Concentration of Powders in Gradient Material
A.N. Anikeev and I.V. Chumanov 486

Electro Physical Hardening of Non Metallic Composite Materials in Additive Technology
I.V. Zlobina, N.V. Bekrenev and G.K. Muldasheva 490

Heating and Cooling Impact on Mechanical Properties of RIP Electric Insulator for High Voltage Inputs
A.N. Demidov, M.A. Karimbekov and A.Y. Marchenkov 496

The Use of Ferrovanadium Production Sludge Wastes in Claydite Gravel Technology
I.V. Starostina, M.M. Simonov and L.V. Denisova 501

Numerical Analysis of Stress-Strain State and Crack Propagation in Welded Samples
M.S. Bisong, P.V. Sivtsev and V.V. Lepov 507

Capillary-Porous Effects in Concrete during Ice Abrasion
L.V. Kim and E.E. Shaly 513

Sorption Properties of Nanostructured Calcium Aluminosilicate with Respect to Cesium Ions
P.S. Gordienko, S.B. Yarusova, I.A. Shabalin and V.A. Dostovalov 518

Temperature and Humidity Dependence on Strength of High Performance Concrete
G.S. Slavcheva and A.T. Bekker 524

Refractory Core-Shell Powders for Additive Industries
S.P. Bogdanov and A.P. Garshin 529

Formation Structure and Properties of Parts from Titanium Alloys Produced by Direct Laser Deposition
M.O. Skytar, O.G. Klimova-Korsmik and V.V. Cheverikin 535

Hydrofluoride Method of Complex Processing of Titanium-Containing Raw Materials
P.S. Gordienko, V.A. Dostovalov and E.V. Pashnina 542
Modified Geomembrane Compositions for Hydraulic Structure Impervious Coatings  
Y.M. Kosichenko and B.O. Baev  

New 3D Cross-Linked Copolymers with Variable Mechanical Properties and High Durability  
V.M. Kapralova, D.D. Karov and A.I. Slutsker  

Research of Processes of Products Fabrication by Self-Propagating High-Temperature Synthesis (SHS) Method  
S.A. Kotov, L.B. Gushchina and M.G. Livintsova  

Applying the Electron Concentration Calculation Method to Assess the Influence of Hydrogen on the Position of the Variable Solubility Lines in Ti-Cr System  
A.A. Popov, A.G. Illarionov and S.V. Grib  

Atomic Structure Design of Rapidly Quenched Amorphous Cobalt-Based Alloys  
E.V. Pustovalov, E.B. Modin and A.N. Fedorets  

Beta-Phase Decomposition Sequence during Continuous Cooling of High-Temperature Titanium Alloy  
D.V. Gadeev, S. Demakov and F.V. Vodolazskiy  

Comparative Assessment of Resistance of Hardwearing Anodes, Ternary Coated with Iridium, Ruthenium and Titanium  
L.N. Fesenko, I.V. Pchelnikov and R.V. Fedotov  

Composite Material for Railroad Tie  
V.V. Stepanov, V.A. Saldaev and V.E. Tsvetkov  

Designing Metamaterial with Arc-Structure for Wide Broad Vibration Isolating  
A. Valeev  

Determining Undefomed Chip Thickness Models in Milling and its Verification during Wood Processing  
A.A. Fomin  

Effect of Pore Architecture of Titanium Implants on Stress-Strain State upon Compression  
Y.N. Loginov, S.I. Stepanov and E.V. Khanykova  

Effect of Thermal and Thermal Magnetic Treatment on Damping Properties of Fe-Cr-Al Alloys  
M.A. Melchakov, A.I. Scvortsov and A.A. Scvortsov  

External Factors Impact on Basic Properties of Hovercraft Skirt Materials  
A.K. Yakimov, Y.N. Butusova and A.V. Tumanin  

Features of Zone Thermal Recrystallization of Germanium Layers Grown on Silicon Substrates from a Discrete Source  
S.N. Chebotarev, A.N. Yatsenko and L.S. Lunin  

GaN Materials Nanostructures Growth Control in the Epitaxial Units  
A. Zhilenkov  

Hardening Kinetics of Geopolymer Binder Based on Magmatic Rock with Mineral Additives  
N.A. Eroshkina and M.O. Korovkin  

Influence of Constant Magnetic Field on Domain Wall Dynamics in YFeO$_3$  
O.Y. Komina and E.A. Zhukov  

Influence of Heat Treatment on Wear Resistance of Alloyed Hadfield Steel and Phase Transformations in it  
K.N. Vdovin, N.A. Feoktistov and D.A. Gorlenko  

Influence of Heating Temperature and Cooling Conditions on Structure and Properties of Two-Phase Titanium Alloy  
F.V. Vodolazskiy, A.V. Zholoba and A.A. Popov  

Influence of Oxygen Concentration on Plasma Dynamic Synthesis Product in Fe-O System  
I. Shanenkov, A. Sivkov and A. Ivashutenko  

Integral Performance Criterion of Self-Propagating High-Temperature Synthesis Ferrosilid for Optimization of Charge Composition  
L.R. Kharisov, N.N. Safronov and G.N. Safronov  

Investigation of Phase Composition of Samples Sintered from Tungsten-Containing Composite Micro- and Nano-Powders  
E.V. Ageev, A.Y. Altukhov, S.V. Khardikov and A.V. Kirichek  

Investigation of Titania Nanotube Arrays Obtained from Glycerol Electrolytes  
D.I. Dyachenko, A.A. Kravchenko and D.V. Kokorina
Limiting Product Surface and its Use in Profile Milling Design Operations
A.A. Fomin

Mediated Electrosynthesis of Cobalt Nanoparticles from Ionic Liquids
A.A. Kravchenko, D.I. Dyachenko and V.T. Fomichev

Multicomponent Diffusion in Metallic Systems Exposed to E-Beams
A.Y. Leyvi, K.A. Talala and A.P. Yalovets

New Material Creation by Phase Separation in Liquid Mixtures Induced by Non-Uniform Electric Field
T.A. Volkova, R.F. Aletdinov and E.M. Fedosov

New Method of Quench Surface Turning
N.N. Zubkov, S.G. Vasil'ev and V.V. Poptsov

On Deformation Powers of the Explosion Welded and Rolled Titanium-Aluminium Composite
D.N. Gurulev, L.V. Palatkina and I.L. Gonik

Overall Hardening of Solid-Rolled Wagon Wheels by Volume Quenching and Surface Plasma Processing
A. Kanayev, A.V. Bogomolov and T. Sarsembayeva

Phase Transformations in D6AC Steel during Continuous Cooling
M.V. Maisuradze, M. Ryzhkov and A.A. Kuklina

Phase Transformations in Novel Medium Carbon High Hardenability Steels
M.V. Maisuradze, M. Ryzhkov and O. Surnaeva

Research into the Structure of Aluminum Matrix Composite AK12+2.38%Cu+0.06%SiC with a Scanning Probe Microscope
S.V. Voronin, K.K. Chaplygin, A.D. Litoshina and S.V. Konovalov

Study of Properties of Multicomponent Heterostructures Based on A\textsuperscript{III}B\textsuperscript{V} Compounds
M.L. Lunina, A.E. Kazakova and D.A. Arustamyan

Sulfoaluminate Cements Composition and Properties
F.L. Kapustin, A.A. Ponomarenko and V.N. Oleinik

The Method for Producing Copper Nanoparticles and Analysis of their Lubricating Ability
S.C. Kim, Y.N. Mansurov and S.H. Li

Use of the Superplasticity Phenomenon of Steel for "Internal" Magnetic Correcting a Product
V.N. Pustovoit, Y. Dolgachev and Y.M. Dombrovskii

Vacuum Arc Deposition of Carbon and Carbon-Based Coatings
A.A. Lisenkov, D.K. Kostrin and M.I. Pikus

Evaluation of Influence of Thermal Methods of Metal Separation Cutting on Welding Quality
A.K. Tingaev, M.A. Ivanov and A.M. Ulano

Application of the Complete Material Balance Method to Estimate the Composition of Weld Metal in Manual Arc Welding
E.B. Votinova and M.P. Shalimov

Cu-Ni-Zn 15-20 Alloy - Particular Qualities of Alloying and Crystallization Parameters
V.R. Baraz, S.S. Gerasimov and I.A. Gruzdeva

Design and Basic Consideration of Electromagnetic Heating Yarns with Foucault Currents for Smart Functional Fabrics
R.R. Sattarov and E.F. Galiakberova

Engineering Analysis Methods for Hydraulic Shell Structures with Infill
N.Y. Tsimbelman, T.I. Chernova and T.E. Shalaya

Effect of Heat Treatment Temperature-Rate Parameters on Structure and Complex of Physical-Mechanical Properties in VST5553 Titanium Alloy Rod Semi-Finished Goods
A.V. Zhehina, A.G. Illarionov and M.S. Kalienko

Influence of Intermetallics on Complex Alloyed Brass Hardness
R.K. Mysik, A.V. Sulitsin and S.V. Brusnitsyn

Influence of Chemical Composition of Tough-to-Machine Materials on Grinding Technologies
T.N. Ivanova

Improving the Properties and Structure of Magnesium Materials of Sol of Iron Hydroxide
V.V. Zimich
Impact of Cooling Character on Structure and CTE of Invar Alloy with 0.6%C
A.S. Zhilin, S.V. Grachev and S.M. Nikiforova 807

Heat Treatment of Carbon, High-Chromium Steels for Mud Pump Liners of Drill Rigs and Drilling Equipment
S.M. Nikiforova, M.A. Filippov and A.S. Zhilin 811

Method for Describing Fatigue Processes in Structural Materials
V. Mironov, O. Lukashuk and D. Vichuzhanin 815

Magnetic and Microstructural Properties of Cobalt Substituted NiZn Ferrite Powders
A.V. Knyazev, E. Lähderanta and I.A. Zakharchuk 821

Investigation of the Equilibrium Germanium-Substituted Wustite with Metal and Spinel Solutions in the Fe-Ge-O System
S.V. Shtin and A.A. Lykasov 827

Investigation of Barium Hexaferrite BaFe$_{12}$O$_{19}$ Electro Physical Parameters Using Open-Ended Coaxial Probe Method
K.M. Zeyde, S.A. Gudkova and D.A. Vinnik 834

Optimizing Conditions for Formation of Local Zones for Thermomigration in Silicon
B.M. Seredin, V.P. Popov and A.N. Zaichenko 839

Research of Surface Phase Formation in Interaction of Granular Composite Sorbent with Technological Multicomponent Saline Solutions
G.G. Mikhailov, A.G. Morozova and T.M. Lonzinger 845

Research of Mechanisms of Copper Ions Removal out of Sewage of Machine-Building Productions by Combined Reagent Based on Industrial Wastes
L.A. Porozhnyuk, N.S. Lupandina and E.V. Porozhnyuk 851

Regulation the Properties of Materials on Magnesia Binder
V.V. Zimich 856

Thermodynamic Modeling of Phase Equilibrium in Fe-Y-Cr-C-O Liquid Metal System
G.G. Mikhailov and L.A. Makrovets 862

Heat Resistance of Certain Structural Steels
A.S. Tyusenkov, A.V. Rubtsov and R.R. Tlyasheva 868

Heterogeneity Estimation of Low-Cycled Steel Weld Probes
M.S. Bisong, S.N. Makharova and V.V. Lepov 873

Influence of Biologically Active Substances on Wastewater Treatment Process
A.I. Khabibrakhmanova, N.A. Yugina and M.V. Shulaev 879

Isothermal Pearlite Formation Kinetics in High-Chromium Cast Irons without Additional Alloying
K.Y. Okishev, E.S. Vasyukova, A.G. Grebenshchikova, A.S. Sozykina and D.A. Mirzaev 884

Numerical Analysis of Modes of Induction Weld Deposition of Valve Tappets of Motor Vehicles
A.M. Osipov, Y.V. Bezzgans and D.G. Lodkov 889

Texture of Hot-Rolled Sheet Fe-3% Si Alloy
S.V. Danilov, A.A. Redikul'isnev and M. Lobanov 895

Thermodynamic Analysis of Copper Melt Deoxidation with Lanthanum
O.V. Samoilova, G.G. Mikhailov and L.A. Makrovets 900

The Thermal Expansion of Solid State BaFe$_{12}$O$_{19}$ and Flux Ba$_{0.8}$Pb$_{0.2}$Fe$_{12}$O$_{19}$ Pellets
S.A. Gudkova, A.S. Chernukha and D.A. Vinnik 906

Chapter 2: Innovative Technologies in Metallurgy Industry

Beneficiation of Vanadium and Titanium Oxides by Using Selective Extraction of Iron in Low-Titanium Magnetite Concentrate
Y. Kapelyushin, V. Roshchin and A. Roshchin 913

Calculation-Experimental Method of Manganese Losses Control in High-Carbon Ferromanganese Slag
A.V. Senin, D.L. Zhuravlev and A.V. Ivanov 919

Chemical and Technological Thermally Activated Process Research of Roasting Pellets in Dense Bed of Conveyor Indurating Machine
V.I. Bobkov, M.I. Dli and A.S. Fedulov 925
Computer-Aided Modeling of a Screw Firmware of the Workpiece and Adequacy Evaluation of Solution Results
V.A. Toporov, O. Panasenko, D.S. Nukhov, A.A. Bogatov and K. Pyankov 931

Deep Treatment of Copper Plant Waste Water Streams with Water Recycling
K.L. Timofeev, A.B. Lebed and A.J. Malyutin 937

Effect of Charge Fractional Composition and the Coke Amount on the Parameters of Manganese Ore Agglomeration
A.V. Senin, A.G. Ryazanov and D.L. Zhuravlev 945

Effect of Continuous Casting Parameters on Quality of Billets Manufactured by UMMC Steel LLC
A.N. Kalitaev, V.D. Tutarova and A.N. Shapovalov 952

Effect of Semisolid Metal Casting of Large Forging Ingots on Quality of Large-Sized Forgings Produced
D.V. Rutskii, N.A. Zyuban and S.B. Gamanyuk 962

Features of Plasma-Electrolytic Coatings Formation on Metalware Surface
V.L. Steblyanko, A.P. Ponomarev and Y.Y. Efimova 969

Force Interaction of Technological Tool and Elastic-Plastic Link at Large Diameter Tubes Preliminary Forming
Y.B. Chechulin, Y.V. Pesin and N.Y. Boklag 975

Heat Treatment of Low-Alloyed Steel up to Grade Q125
S. Iyengar, A.V. Bogomolov and A. Zhakupov 981

Improvement of Surface Quality of Casting Produced by Casting under Pressure
R.V. Gavarirov and I.A. Savin 988

Industrial, Ecological and Resource-Efficient Aspects of Vanadium Production and Use of Technogenic Vanadium Sources
E.S. Makhotkina and M.V. Shubina 994

Influence of Hot Rolling Technological Regimes on 6061 Aluminium Alloy Sheet Texture
S.V. Damilov, I.A. Mustaeva and M.A. Golovnin 999

Kinetic Description of (Cr, Fe)7C3 Carbide Precipitation from Austenite in High-Carbon Fe-Cr-C Ternary Alloys
E.S. Vasyukova, K.Y. Okishev, A.S. Sozykina, A.M. Karlikov and D.A. Mirzaev 1005

Layered Composite Materials Designed for Higher Corrosion Resistance of Oil Production Equipment
N.A. Bogatov, A.A. Bogatov and D.R. Salikhyanov 1011

Lost Foam Casting with the Use of Recycling and Nanostructured Materials
L.G. Znamenskii, O.V. Ivochkina and A.S. Varlamov 1016

Magnetic Wave Technology of Grinding Slime Separation
Y.M. Vernigorov, B.G. Gasanov and S.S. Baev 1020

Mathematical Model of Hot Rolling Temperature Parameters
M.A. Sosedkova, L.V. Radionova and T.A. Lisovskaya 1026

Minimizing the Dynamic Loads in Pilger Rolling Mill Forholler
Y.B. Chechulin and Y.A. Popov 1034

Modern Packaging Materials for Steel Products
L.G. Kolyada, E.V. Tarasyuk and S.A. Krylova 1040

Modernization of Hot-Rolled Tubes Rolling Method
D.A. Pavlov, A.A. Bogatov and E.A. Pavlova 1048

Nonwaste Recycling of Nonferrous Metallurgy Slags in Iron Casting
S.V. Davydov and O.A. Gorlenko 1053

Physical and Mathematical Foundations Describing Crystallization Process of Melt Cooling on a Moving Wall by Fourier Method and Duhamel Theorem

Polymetallic Ore Concentration Middlings Nitric Acid Leaching Kinetics
D.A. Rogozhnikov and B.V. Kolmachikhin 1065

Relationship between Dendritic Structure of Grey Cast Iron and Mechanical Properties of Castings
A. Baron, L.V. Palatkina and I.L. Gonik 1071

Research on Metal Forming in Pipe Ends Upsetting Process
M.V. Erpalov and A.A. Bogatov 1076
Resource-Saving Technology of Recycling of Wastes of Secondary Aluminium Production in a Blast Furnace in the Process of Aluminous Slag Smelting
E.S. Makhotkina, O.S. Ponomareva and L.G. Kolyada 1081

Simulation of Power Efficient Cooling Technology for Continuously Cast Bars
L.L. Demidenko 1086

Stressed State of the Shaped Casting under the Impact of Hindered Contraction
V.M. Kolokol’tsev, A.S. Savinov and A.S. Tubol’tseva 1092

Study of the Hot Top Performance with Various Heat Insulators
D.V. Rutskii, N.A. Zyuban and S.B. Gamanyuk 1099

Surfactants Influence on Sphalerite Wetting during Zinc Concentrate Pressure Leaching
E.B. Khazieva, V.V. Sviridov, S.S. Naboychenko and V.A. Menshchikov 1104

Systems Analysis of Process Control Capabilities for Forging Accuracy
V.G. Shibakov, D.L. Pankratov and R. Khairullin 1110

Increasing of Long Products Rolling Efficiency: Modernization of Stelmor Air Cooling Line to Obtain Sorbitized Wire Rod
O.N. Tulupov, A.B. Moller and S.Y. Sarancha 1116

Improving the Rolling Technology at Mill 450 OJSC "MMK" to Reduce the Level of Alloying of 09G2S Steel Designed for Strength Class up to 440 MPa
A.B. Moller, D.I. Kinzin and S.A. Levandovskiy 1123

Simulation of Thermal Conditions during Rolling of I-Beams at Modern Rail and Structural Steel Mill
S. Nepriakhin 1130

Analysis of Efficiency of Roll Pass Design Options for Roughing Stands of Section Rolling Mill
D.I. Kinzin, S.A. Levandovskiy and O.N. Tulupov 1136

Simulation of Centrifugal Casting and Structure of Fe-Ni-Co Super-Invar Alloy
O.M. Ogorodnikova, V.I. Chermensky and I.V. Konchakovskiy 1142

Influence of Structural Components on Strength Properties of Silicate Stone Casting Materials during Controlled Crystallization
A.O. Artemov, M.N. Ignatov and A.M. Ignatova 1148

Determination of Frictional Forces during Wire Rod Drawing Process by Reverse Method
S.I. Platov, V.A. Nekit and N.N. Ogarkov 1152