

# Table of Contents

## Preface

## Chapter 1: Properties and Application of Modern Materials

<b>Influence of Molybdenum on Structure and Properties of Iron-Based Alloys</b> E.V. Koreshkova and A.A. Kulemina	3
<b>Experimental Research of Crack Resistance of Composite Materials</b> S. Koryagin, N. Velikanov and O.V. Sharkov	8
<b>Patterns of Wave Deformational Multicontact Half-Subspace Loading</b> A.V. Kirichek, S.V. Barinov and A.V. Yashin	12
<b>Qualitative Characteristics of MoS<sub>2</sub> Solid-Lubricant Coating Formed by Vibro-Wave Impact of Free-Moving Indenters</b> V.V. Ivanov, S.I. Popov and A.V. Kirichek	18
<b>Quality of Metal Deposited Flux Cored Wire with the System Fe-C-Si-Mn-Cr-Mo-Ni-V-Co</b> A.I. Gusev, N.A. Kozyrev, I.V. Osetkovskiy, O.A. Kozyreva and D.V. Valuev	23
<b>Radiation-Modification Impact on the Filled Polytetrafluoroethylene Structure and Mechanical Strength</b> A.P. Morgunov and I.V. Revina	29
<b>Studying Temperature Effects on Internal Microstresses in Indexable Inserts Made of (Ti,W)C-Co Group Hard Alloys</b> R.S. Chuikov, S.S. Chuikov, A.S. Stavyschenko and V.A. Vasilkovich	35
<b>Effect of Ageing Process on Properties of Tube Steel under Conditions of Tyumen Region</b> I.L. Polyanskaya and L.V. Belova	40
<b>Tungsten Surface Erosion by Hydrogen Plasma Irradiation</b> B.K. Rakhadilov, M.K. Skakov and T.R. Tulenbergenov	46
<b>Determination of Parameters of Endurance Limit Distribution Law of Material by the Methods of Nonparametric Statistics and Kinetic Theory of High-Cycle Fatigue</b> K. Syzrantseva and V. Syzrantsev	52
<b>Thermal Properties and Phase Composition of Full-Scale Corium of Fast Energy Reactor</b> M.K. Skakov, N. Mukhamedov, I.I. Deryavko and I.M. Kukushkin	58
<b>Influence of the Cobalt Additive on the Flux Cored Wire of System Fe-C-Si-Mn-Cr-Ni-Mo-V</b> I.V. Osetkovskiy, N.A. Kozyrev, A.I. Gusev, O.A. Kozyreva, R.A. Gizatulin and A.V. Valueva	63
<b>Mathematical Models for Calculation of Crack Resistance of Composite Materials</b> S. Koryagin, O.V. Sharkov and N. Velikanov	68
<b>The Formation of Surface Roughness of Piston Rings for the Purpose of Improving the Adhesion of Wear-Resistant Coatings</b> V.V. Maksarov and V.A. Krasnyy	73

## Chapter 2: Metallurgical Technologies and Technologies of Mechanical Processing

<b>The Research into the Effect of Conditions of Combined Electric Powered Diamond Processing on Cutting Power</b> D.V. Lobanov, P.V. Arkhipov, A.S. Yanyushkin and V. Skeebea	81
<b>Forecasting Performance of Ceramic Cutting Tool</b> V.V. Maksarov and A. Khalimonenko	86
<b>Technology of Selective Laser Melting Formation of Heterogeneous Powder Structures</b> O.I. Grinin, E.A. Valdaytseva, I.T. Lasota, Y.B. Pevzner and V.V. Somonov	91
<b>Improving Dimensional Accuracy of Turning on CNC Equipment</b> R.Y. Nekrasov, I.V. Soloviev, A.I. Starikov and O.V. Bekareva	95

<b>The Effect of Additionally Introduced Impurities of Fe and Pb Ions on Silver Azide Decomposition</b> A.P. Rodzevich, L.V. Kuzmina, E.G. Gazenauer, V.I. Krashenin, D.Y. Sozinov and R.A. Mamadaliev	101
<b>Mechanical Zinc Coating Procedure under Conditions of Vibration Mechanical-Chemical Impact</b> V.V. Ivanov, N.S. Dontsov and A.V. Kirichek	105
<b>Application of Integrated Methods to Improve the Technological Properties of Steel</b> S.N. Fedoseev, D.V. Valuev, R.A. Mamadaliev and P.N. Sokolov	110
<b>Modern Methods of Rail Welding</b> N.A. Kozyrev, U. A.A., R.E. Kryukov, S. R.A., R.A. Gizatulin and A.V. Valueva	116
<b>Technological Exercise of Cell Structure Forming</b> S.N. Larin, V.I. Platonov and G.A. Nuzgdin	122
<b>Use of Ceramic Injection Molding Technology to Increase Biogas Burners Efficiency</b> V.Y. Sokolov, S.A. Naumov, A.V. Sadchikov and S.V. Mitrofanov	127
<b>Integrated Quality Ensuring Technique of Plasma Wear Resistant Coatings</b> E.A. Zverev, V. Skeebe, N.V. Martyushev and P.Y. Skeebe	132
<b>Application of Novikov Gears, Gear Processing Techniques and Enhanced Possibilities of their Production</b> A.A. Silich and E.G. Ishkina	138
<b>Control of the Condition and Preparation of Surfaces with Heterogeneous Characteristics for Electrolytic Chrome-Plating</b> I.M. Kovenskiy, V.S. Malysh and A.A. Kulemina	143
<b>New Damage Criteria for Machining Considering Contact Friction for FE Analysis</b> A.I. Khaimovich and D.L. Skuratov	147
<b>On the Peculiarities of the Circular Cutter Geometry Applied for Cutting the Wheels of Novikov's Gearings</b> A.A. Silich, R.Y. Nekrasov and A. Zinchenko	153

### **Chapter 3: Building Materials and Construction Technologies**

<b>Putty on the Base of a Modified Silicate Binding Agent</b> V. Loganina	161
<b>Heat-Resistant Porous Composite Based on Ordinary Clay for Thermal Insulation of Hot Surfaces</b> V.A. Beregovoi and A.M. Beregovoi	166
<b>Improvement of Truss Bearing Capacity by Means of Rhombic Pipes</b> A.S. Marutyan, P.S. Chernov, V.N. Orobinskaya and E.V. Galdin	171

### **Chapter 4: Chemical Engineering and Technologies of Waste Treatment**

<b>Use of Natural Zeolite in Systems for Separation and Purification of Gas Mixtures Containing Methane</b> A.V. Sadchikov, S.V. Mitrofanov, V.Y. Sokolov and S.A. Naumov	179
<b>Composite-Sorbent Based on Natural Mineral and Waste of Biological Treatment of Wastewater (Effluent)</b> A.A. Voytyuk, E.V. Moskvicheva, D.V. Shchitov, K.V. Katerinin, P.A. Sidiyakin and E.Y. Lykova	183
<b>The Composite Material from the Recycled Raw Materials in the Purification of Oily Wastewater Technology</b> E.V. Moskvicheva, P.A. Sidiyakin, A.V. Moskvicheva, E.P. Doskina, D.V. Shchitov, E.Y. Lykova and L.N. Fesenko	187
<b>Processing of Industrial Metallurgical Wastes as the Basis of Manufacturing Technology Welding Fluxes and Additives NIM1</b> N.A. Kozyrev, R.E. Kryukov, O.A. Kozyreva, R.A. Gizatulin and A.V. Valueva	191