

Table of Contents

The New SPD Processing Trends to Fabricate Bulk Nanostructured Materials R. Valiev	7
Features of Cyclic Extrusion Compression: Method, Structure & Materials Properties M.W. Richert	19
Formation of Submicrocrystalline Structure in Titanium Aluminides and their Mechanical Properties G.A. Salishchev, R.M. Imayev, V.M. Imayev, M.R. Shagiev and F.H. Froes	29
Mechanical Properties of Aluminium Processed by ECAP R.M. Molak and Z. Pakiela	39
Microstructures and Mechanical Property of Ni Processed by High-Pressure Torsion and Their Evolution upon Annealing Z.Q. Yang	45
Combination of ECAP and Hydrostatic Extrusion for UFG Microstructure Generation in Nickel M. Kulczyk, W. Pachla, A. Swiderska-Sroda, N.A. Krasilnikov, R. Diduszko, A. Mazur, W. Łojkowski and K.J. Kurzydłowski	51
The Influence of Hydrostatic Extrusion on the Properties of an Austenitic Stainless Steel J. Budniak, M. Lewandowska, W. Pachla, M. Kulczyk and K.J. Kurzydłowski	57
Processing by Hydrostatic Extrusion of Titanium Coated with Aluminides H. Garbacz, W. Pachla, T. Wierzchoń and K.J. Kurzydłowski	63
Features of Twist Extrusion: Method, Structures & Material Properties Y. Beygelzimer, D. Orlov, A. Korshunov, S. Synkov, V. Varyukhin, I. Vedernikova, A. Reshetov, A. Synkov, L. Polyakov and I. Korotchenkova	69
Mechanical Properties and Deformation Behaviour of Ultra-Fine Grained Nickel N.A. Krasilnikov, W. Łojkowski, Z. Pakiela and K.J. Kurzydłowski	79
High Strength and Ductility of Nanostructured Al Alloy 2024 Subjected to High Pressure Torsion D. Vorona, A.V. Sharafutdinov and N.A. Krasilnikov	85
Strength of Commercial Aluminum Alloys after Equal Channel Angular Pressing and Post-ECAP Processing M.Y. Murashkin, M.V. Markushev, J. Ivanisenko and R. Valiev	91
Equal Channel Angular Pressing, its Effect on Structure and Properties of the Constructional Steel St3 M.Z. Borisova, S.P. Yakovleva and A.M. Ivanov	97
Analysis of the Deformation Behaviour of Cu Processed by High Pressure Torsion V.D. Sitdikov, R.G. Chembarisova and I.V. Alexandrov	101
Mechanism of Grain Refinement in Aluminium in the Process of Hydrostatic Extrusion M. Lewandowska	109
Microstructural Refinement under High Plastic Strain Rates during Hydrostatic Extrusion K.J. Kurzydłowski, M.W. Richert, B. Leszczyńska, H. Garbacz and W. Pachla	117
Deformation-Induced Nanocrystallization in Al-Rich Metallic Glasses N. Boucharat, R.J. Hebert, H. Rösner and G. Wilde	123
Phase Transformations in Pearlitic Steels Induced by Severe Plastic Deformation J. Ivanisenko, I. MacLaren, X. Sauvage, R. Valiev and H.J. Fecht	133
The Influence of Hydrostatic Extrusion on the Microstructure of 6082 Aluminium Alloy P. Widlicki, H. Garbacz, M. Lewandowska, W. Pachla, M. Kulczyk and K.J. Kurzydłowski	145
The Effect of Dispersoids and Processing Variables on Grain Refinement of Aluminium Alloys Deformed by ECAE M. Berta and P.B. Prangnell	151
Evolution of Precipitate Coarsening Reaction in a Nanostructured Fe-Ni-Mn Maraging Alloy S. Hossein Nedjad, M. Nili-Ahmadabadi, T. Furuhashi and T. Maki	159
Processing and Characterization of AlCu Aluminium Alloys by the ECAE Method M. Lech-Grega, S. Boczkal, J. Senderski and B. Plonka	165

Influence of Severe Plastic Deformation on the PLC Effect and Mechanical Properties in Al 5XXX Alloy J. Zdunek, P. Widlicki, H. Garbacz, J. Mizera and K.J. Kurzydłowski	171
SPD Processed Alloys as Efficient Vacancy-Hydrogen Systems A.K. Wieczorek, M. Krystian and M.J. ZEHETBAUER	177
Combined SPD Techniques to Fabricate Nanostructured Ti Rods for Medical Applications G.H. Salimgareeva, I.P. Semenova, V.V. Latysh, I.V. Kandarov and R. Valiev	183
The Role of Inclusions in the Corrosion Resistance of Hydrostatically Extruded Steel Products D. Klassek, T. Suter, P. Schmutz, W. Pachla, M. Lewandowska, K.J. Kurzydłowski and O. von Trzebiatowski	189
The Role of Plastic Deformation in the Process of Powder Sintering Y.V. Milman and A.N. Slipenyuk	199
Microstructural Evolution during Mechanical Alloying and Hot Pressing of a Powder Blend of Aluminium and 316 Stainless Steel A. Samanta, P.P. Chattopadhyay, W. Łojkowski, S. Gierlotka, H.J. Fecht and I. Manna	211
Fabrication and Micro-Structure Characterization of Al₂O₃/Ni-P Composites with Interpenetrating Phases J. Michalski, T. Wejrzanowski, S. Gierlotka, J. Bieliński, K. Konopka, T. Kosmač and K.J. Kurzydłowski	219
Nanocrystalline Cu-Al₂O₃ Composites Sintered by the Pulse Plasma Technique A. Michalski, J. Jaroszewicz, M. Rosiński, D. Siemiaszko and K.J. Kurzydłowski	227
Nanocrystalline NiAl-TiC Composites Sintered by the Pulse Plasma Method M. Rosiński and A. Michalski	233
Pulse Plasma Sintering of Nano-Crystalline Cu Powder A. Michalski, M. Rosiński, D. Siemiaszko, J. Jaroszewicz and K.J. Kurzydłowski	239
Nanocrystalline Cemented Carbides Sintered by the Pulse Plasma Method A. Michalski, D. Siemiaszko, J. Jaroszewicz, M. Rosiński and M. Psoda	245
Influence of High Pressure Hot Compaction on Microstructure of Al-Si-Ni-Mn Alloys G. Cieślak, J. Latuch and T. Kulik	251
SiC – Zn Nanocomposites Obtained Using the High – Pressure Infiltration Technique A. Swiderska-Sroda, G. Kalisz, E. Grzanka, S. Gierlotka, S. Stelmakh, N. Herlin-Boime and B.F. Palosz	257
Downscaling Equal Channel Angular Pressing A. Zi, Y. Estrin, R.J. Hellmig, M. Kazakevich and E. Rabkin	265
Synthesis of Diamond Particles under Alkaline Hydrothermal Conditions N. Yamasaki, K. Yokosawa, S. Korablov and K. Tohjt	271
Nanotube and Nanorod Synthesis under High Frequency Electric Discharge Assisted Mechanical Milling A. Calka, D. Wexler and A.Y. Mosbah	277
Buried Nano - Structured Layers in High Temperature – Pressure Treated Si:He A. Misiuk, B. Surma, J. Bak-Misiuk and V. Raineri	285
Pressure-Assisted Lateral Nanostructuring of the Epitaxial Silicon Layers with SiGe Quantum Wells I.V. Antonova, M.B. Gulyaev, V.A. Skuratov, R.A. Soots, V.I. Obodnikov, A. Misiuk and P. Zaumseil	291
Fabrication and Physical Properties of SiC-GaAs Nano-Composites G. Kalisz, E. Grzanka, D. Wasik, A. Swiderska-Sroda, S. Gierlotka, J. Borysiuk, M. Kaminska, A. Twardowski and B.F. Palosz	297
Nanopowder Diffraction Theory – Line Profile for Polydispersive Powders R. Pielaszek	303
Error Estimation in XRD Crystallite Size Measurements R. Pielaszek, W. Łojkowski, S. Gierlotka and S. Doyle	313
SAXS and XAFS Analysis in Forming of Metal Nanoparticles in Water-in-scCO₂ Microemulsions M. Harada and Y. Kimura	321
X-Ray Analysis of High Pressure Torsion Induced Nanostructures in Ti and Ni A.R. Kilmametov, R. Valiev and I.V. Alexandrov	329

Texture Development in a Model Al-Li Alloy Subjected to Severe Plastic Deformation B. Adamczyk-Cieślak, J. Mizera and K.J. Kurzydłowski	337
Metallic Nano-Materials and Nanostructures: Development of Technology Roadmap A. Daniszewska, W. Łojkowski, H.J. Fecht, K.J. Kurzydłowski, U. Narkiewicz, G.A. Salishchev, M.J. ZEHETBAUER, M. Kulczyk, M. Chmielecka and D. Kuzmenko	345