

Table of Contents

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

Influence of Severe Plastic Deformation on the PLC Effect and Mechanical Properties in Al 5XXX Alloy	171
J. Zdunek, P. Widlicki, H. Garbacz, J. Mizera and K.J. Kurzydlowski	
SPD Processed Alloys as Efficient Vacancy-Hydrogen Systems	177
A.K. Wieczorek, M. Krystian and M.J. ZEHETBAUER	
Combined SPD Techniques to Fabricate Nanostructured Ti Rods for Medical Applications	183
G.H. Salimgareeva, I.P. Semenova, V.V. Latysh, I.V. Kandarov and R. Valiev	
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. Kurzydlowski and O. von Trzebiatowski	189
The Role of Plastic Deformation in the Process of Powder Sintering	199
Y.V. Milman and A.N. Slipenyuk	
Microstructural Evolution during Mechanical Alloying and Hot Pressing of a Powder Blend of Aluminium and 316 Stainless Steel	211
A. Samanta, P.P. Chattopadhyay, W. Lojkowski, S. Gierlotka, H.J. Fecht and I. Manna	
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. Kurzydlowski	219
Nanocrystalline Cu-Al₂O₃ Composites Sintered by the Pulse Plasma Technique	227
A. Michalski, J. Jaroszewicz, M. Rosiński, D. Siemiaszko and K.J. Kurzydlowski	
Nanocrystalline NiAl-TiC Composites Sintered by the Pulse Plasma Method	233
M. Rosiński and A. Michalski	
Pulse Plasma Sintering of Nano-Crystalline Cu Powder	239
A. Michalski, M. Rosiński, D. Siemiaszko, J. Jaroszewicz and K.J. Kurzydlowski	
Nanocrystalline Cemented Carbides Sintered by the Pulse Plasma Method	245
A. Michalski, D. Siemiaszko, J. Jaroszewicz, M. Rosiński and M. Psoda	
Influence of High Pressure Hot Compaction on Microstructure of Al-Si-Ni-Mm Alloys	251
G. Cieślak, J. Latuch and T. Kulik	
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	265
A. Zi, Y. Estrin, R.J. Hellmig, M. Kazakevich and E. Rabkin	
Synthesis of Diamond Particles under Alkaline Hydrothermal Conditions	271
N. Yamasaki, K. Yokosawa, S. Korablov and K. Tohjt	
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	285
A. Misiuk, B. Surma, J. Bak-Misiuk and V. Raineri	
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 Polydisperse Powders	
R. Pielaśek	303
Error Estimation in XRD Crystallite Size Measurements	
R. Pielaśek, 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. Kurzydlowski

337

Metallic Nano-Materials and Nanostructures: Development of Technology RoadmapA. Daniszewska, W. Łojkowski, H.J. Fecht, K.J. Kurzydlowski, U. Narkiewicz, G.A. Salishchev,
M.J. ZEHETBAUER, M. Kulczyk, M. Chmielecka and D. Kuzmenko

345