

Table of Contents

Preface

Novel Multicomponent Alloys

B. Cantor, F. Audebert, M. Galano, K.B. Kim, I.C. Stone and P.J. Warren 1

Metastable Nanostructured SPD Ti-Ni Alloys with Unique Properties

R. Valiev, D. Gunderov and V.G. Pushin 7

Primary Nanocrystallization and Amorphous Alloy Stability

J.H. Perepezko and R.J. Hebert 13

The Scale of Devitrification in Bulk Metallic Glasses

A.L. Greer 19

Amorphous Metal Formation and Crystallization - Coupled Processes in Crystal Nucleation

K.F. Kelton 25

In Situ Formed Bulk Nanostructured Ti-Base Composites

J. Eckert, J. Das, G. He, W. Löser, E. Ma, Y. Li, M.L. Sui, T.G. Woodcock and A. Gebert 31

Rapid Solidification of Au Alloys

L. Battezzati, G. Fiore and M. Massazza 37

Structure and Surface States of Cu-O Based Nanocrystalline Powders

A.Y. Yermakov, M.A. Uimin, V.R. Galakhov, A.A. Mysik, O.V. Koryakova, V.G. Kharchuk, V.A. Vykhodetz, V.S. Gaviko, K. Kuepper, S. Robin and M. Neumann 43

Non-Equilibrium Arc-Melted Binary Ti-Fe Bulk Alloys with Ultra-High Strength and Enhanced Ductility

D.V. Louzguine-Luzgin, H. Kato and A. Inoue 49

Phase Formation in Quinary Ti-Based Nanocomposites and an Analogous Ternary System with a View to Thermodynamic Modelling

T.G. Woodcock, F.-. Xie, G. Alcalá, S. Mato, W. Löser, A. Gebert, J. Eckert and L. Schultz 53

Crystallization Behavior of Co-Sputtered Amorphous Ti-C and Co-C Thin Films

T.J. Konno and K. Bandoh 57

Elasticity Study of Nanostructured Copper Thin Films

H. Mizubayashi, K. Fujita, K. Fujiwara and H. Tanimoto 61

Surface Nano-Structuring of Zr Thin Film via Ni-Implantation

S. Muraishi and T. Aizawa 65

The Formation of Nanocrystalline Structure in Amorphous Fe-Si-B Alloy by Severe Plastic Deformation

G.E. Abrosimova, A.S. Aronin, S.V. Dobatkin, S.D. Kaloshkin, D.V. Matveev, O.G. Rybchenko, E.V. Tatyanin and I.I. Zverkova 69

High Temperature Synthesis of Si-Based Nanomaterials from Silica Rich Oxide

S.V. Komarov, D.V. Kuznetsov, V.V. Levina and M. Hirasawa 73

Novel Composites Aluminum-Multi-Walled Carbon Nano-Tubes

R. Martínez-Sánchez, I. Estrada-Guel, M. Miki-Yoshida, I. Segura-Cedillo, W. Antúnez-Flores and J.I. Barajas-Villaruel 77

Temperature Dependence of Elastic Constant of Zr-Cu-Al-Ni Bulk Glasses Measured by Ultrasonic-Wave Resonance

D. Okai, K. Kakei, T. Fukami, T. Yamasaki, T. Zhang and A. Inoue 81

Blanking of Bulk Amorphous Alloy Sheets Fabricated by a Squeeze Casting Method under Hydraulics Pressure

H.G. Jeong, W.J. Kim, J.C. Bae, D.J. Yoon, S.J. Lim and K.H. Na 85

Jump-Like Deformation of Zr_{46,8}Ti₈Cu_{7,5}Ni₁₀Be_{27,5} Bulk Amorphous Alloy

E.D. Tabachnikova, V.Z. Bengus, Y.I. Golovin, V.I. Ivolgin, V.V. Korenkov, A.I. Tyurin, S.V. Potapov and M.P. Macht 89

Design and Synthesis of Cu-Based Metallic Glass Alloys with High Glass Forming Ability

Y.C. Kim, D.S. Sung and E. Fleury 93

Preparation of Mg-Y-Cu Bulk Metallic Glass by High Energy Ball Milling

P.Y. Lee, M.C. Kao and C.K. Lin 97

From Bulk Metallic Glasses to Amorphous Metallic Coatings	
M. Petrzlik, P.V. Vakaev, T.R. Chueva, T.A. Sviridova, V.V. Molokanov, Y.K. Kovneristy and E.A. Levashov	101
Synthesis of Ni-Based Bulk Metallic Glasses Composites by Spark Plasma Sintering	
J.K. Lee, H.J. Kim, T.S. Kim, D.M. Lee, S.Y. Shin and J.C. Bae	105
Effect of Low Temperature Pre-Annealing on the Thermal Stability and Mechanical Properties of Ni-Zr-Al-Hf-Nb Bulk Metallic Glass	
W.B. Kim, B.J. Ye, J.C. Bae and S.H. Yi	109
Mechanical Alloying of Metal Matrix Composites Reinforced by Quasicrystals	
S.D. Kaloshkin, V.V. Tcherdyntsev, A.A. Stepashkin, V.N. Gulbin, B.V. Jalnin, A.I. Laptev, E.V. Obrucheva and V.D. Danilov	113
Thermal Stability and Magnetic Properties of (Fe,Co)-RE-B Bulk Glassy Alloys	
W. Zhang, Y. Long, M. Imafuku, X.M. Wang and A. Inoue	117
Magnetism and Self-Assembled Structure Utilizing Micro- and Nano-Particles	
K. Shimada, A. Shibayama, E. Yuze, H. Saitoh and S. Ishio	121
Fabrication of Magnetic Ni and Fe Nano Powders by Levitational Gas Condensation (LGC) Method	
Y.R. Uhm, J.S. Oh, W.W. Kim and C.K. Rhee	125
Hydrogen Evolution Reaction on $\text{Co}_{30}\text{Ni}_{70}$, $\text{Co}_{30}\text{Mo}_{70}$, $\text{Ni}_{30}\text{Mo}_{70}$, and $\text{Co}_{10}\text{Ni}_{20}\text{Mo}_{70}$ Alloy Powders Produced by Mechanically Alloying	
M.A. Domínguez-Crespo, E.M. Arce Estrada, L. Díaz-García, J.R. Vargas-García, M. Plata-Torres and I. Avila-García	129
Nano-Scaled Microstructure Evolution of W-Ni-Fe-Co Heavy Alloy by Mechanical Alloying	
J.S.C. Jang, K. Liu, S.F. Tsao, L.J. Chang, J.C. Fwu, C.T. Hsu and K.H. Tseng	133
Mechanical Properties of Nanocrystalline L1_2-Type $(\text{Al}+12.5\text{at.\%M})_3\text{Zr}(\text{M}=\text{Cu ,Mn})$ Synthesized by Mechanical Alloying	
S.H. Lee, K.I. Moon and K.S. Lee	137
Mechanically Alloyed Boride/$\text{Ti}_{50}\text{Cu}_{18}\text{Ni}_{22}\text{Al}_4\text{Sn}_6$ Glassy Alloy Composites with a Wide Supercooled Liquid Region	
L.C. Zhang, Z.Q. Shen, S.D. Kaloshkin and J. Xu	141
Preparation of Ti_5Si_3-Reinforced Titanium Aluminides by Mechanical Alloying from Brittle Powders	
H.M. Wu and J.H. Huang	145
Microstructural Evolution in Mechanically Alloyed Nanocrystalline Al-20 at.% Mg Alloy	
A. Revesz, L. Nagy, G. Ribárik, Z. Kovács, T. Ungár and J. Lendvai	149
Consolidation of Mechanically Milled Cu-Al₂O₃ Composite Powder	
D. Hernández-Silva, C.A. Cordoba-Rodriguez and M.A. García-Bernal	153
Deformation and Dissolution of Cementite by Severe Plastic Deformation	
M. Umehoto, Y. Todaka, A. Ohno, M. Suzuki and K. Tsuchiya	157
Preparation of Metallic Glass/Crystalline Metal Conjoined Parts by Plastic Flow Joining Process	
R. Tominaga, K. Amiya, A. Tokairin, Y. Fujimoto, S. Takahashi and A. Inoue	161
Microstructural Characterization in Al-C-Al₂O₃ Composites Produced by Mechanical Milling	
A. Santos-Beltrán, V. Gallegos-Orozco, A. Díaz-Díaz, I. Estrada-Guel, M. Miki-Yoshida and R. Martínez-Sánchez	165
Characterization of Al-Based Composites Produced by Mechanical Milling Using Electron Energy Loss Spectroscopy	
V. Gallegos-Orozco, A. Santos-Beltrán, I. Estrada-Guel, R. Martínez-Sánchez and F. Espinosa-Magaña	169
Mechanically Driven Nanostructured Magnesium-Aluminum Alloy	
H. Yabe and T. Kuji	173
Synthesis and Electrochemical Properties of Mg-Ni-Y-Al Alloy with Mechanical Alloying	
L.M. Wang, X.B. Zhang and M.S. Zhao	177
Dynamic Compaction of Mechanically Alloyed Fe-Si Nano Powders by Magnetic Pulsed Pressure	
G.H. Lee, C.K. Rhee, W.W. Kim and K.S. Lee	181
Preparation of FePt Alloys by Mechanical Alloying	
H. Yoshida, H. Kimura, S. Yamaura, T. Shima and A. Inoue	185

The Behavior of CoSn and CoIn₂ Intermetallic Compounds upon Mechanical Milling	189
Y.S. Kwon, P.P. Choi and K.B. Gerasimov	
Low Temperature Phase Formation in Mechanically Alloyed Cu-Ga Powders	193
S.J. Hong and C. Suryanarayana	
Texture Control of Bulk Mechanical Alloyed Bi-Te Thermoelectric Materials via Shear Extrusion	197
S.S. Kim and T. Aizawa	
Crystallization and Thermal Properties of Zr-Al-Cu-Ni Based Amorphous Alloy Added with Boron and Silicon	201
J.S.C. Jang, S.C. Lu, L.J. Chang, T.H. Hung, J.C. Huang and C.Y.A. Tsao	
Low-Temperature Crystallization of Metallic Glass Induced by Electropulsing	205
T. Hao, H. Tanimoto and H. Mizubayashi	
Inflammability of Melt-Spun Zr-Based Metallic Glasses	209
L. Jastrow, M. Meuris and U. Köster	
Microstructure of a Metallic Glass Joint Welded by Electron Beam Examined by Anomalous Small-Angle Scattering at Zr K Edge	213
I. Murase, H. Okuda, R. Kurosaki, S. Ochiai, Y. Yokoyama and K. Inoue	
Structural Observation and RMC Modeling for Ni-Zr and Cu-Zr Metallic Glasses	217
T. Fukunaga, D. Touya, K. Itoh, T. Otomo, K. Mori, H. Kato and M. Hasegawa	
Effect of Ion-Implantation on the Mechanical Properties of a Zr-Ni Amorphous Alloy	221
H. Kubota, S. Koyama, K. Takashima and Y. Higo	
Glass Transition T_g and Thermal Expansion in Glassy Materials Measured by Time-Resolved X-Ray Diffraction	225
K. Ota, K. Hajlaoui, G. Vaughan, M. Di Michiel, D.V. Louzguine-Luzgin, A. Inoue and A.R. Yavari	
Zero Temperature Coefficient and Stability of Electrical Resistibility of Ni-Si-B Amorphous Alloys	229
T. Bitoh, A. Makino, M. Zama and H. Kudoh	
Material Performance and Phase Transformation of Super Rapid-Solidified Shape Memory TiNiCu Ribbon with Nano-Amorphous Microstructures	233
M. Yokoyama, Y. Furuya, Y. Shinya, T. Okazaki, S. Kajiwara, T. Kikuchi, K. Ogawa, H. Kimura and A. Inoue	
Full-Potential KKR Calculations for Point Defect Energies in Al	237
T. Hoshino and F. Nakamura	
The Entropy of Grafted Polymer Layers in Good Solvent	241
T. Sakamoto, S. Ishii and K. Ohno	
First-Principles Calculations of Hydrogen-Terminated Si(100)2x1 Surface with Missing Dimers	245
S. Masatsuji, Y. Noguchi, S. Ishii and K. Ohno	
Calculation of Energy Bands for Peanuts-Shaped Fused Fullerene Polymers	249
S. Ueda, Y. Noguchi, S. Ishii, J. Onoe and K. Ohno	
Effect of Fe Content on Structure and Surface Properties of Hydrotalcite-Like Compounds	253
J. Ortiz Landeros, B. Zeifert, M. Hesiquio-Garduño, A. Vázquez and J. Salmones	
Structures and Mössbauer Spectra for Fe-C Powders Prepared by Atomization	257
K. Tokumitsu and R. Yamamoto	
Development of High Performance Magnesium Alloys by Rapid Solidification	261
Z.H. Chen, J. Chen, W. Xia and H.G. Yan	
Ultra-Strong and Ductile Hypereutectic Ti-Based Bulk Alloys	265
L.V. Louzguina, D.V. Louzguine-Luzgin and A. Inoue	
Viscosity of Some Fe-Ni Based Liquid Alloys and Their Rapid Solidification	269
T. Yamasaki, H. Ushio, D. Okai, T. Fukami, H. Kimura, K. Sasamori and A. Inoue	
On the Role Played by a Liquid in the Preparation of Nanocrystalline Materials by Ball-Milling	275
D. Guérard and R. Janot	
Properties of Al-MgB₂ Materials Processed by Mechanical Alloying and Spark Plasma Sintering	279
M. Kubota, J. Kaneko and M. Sugamata	
Development of Metallic Glasses by Semi-Empirical Calculation Method	283
A. Takeuchi and A. Inoue	

Pinpoint the Best Glass Forming Alloy by Microstructure Study in Cu₈Zr₃-Cu₁₀Zr₇ Eutectic System of Cu-Zr Binary System	287
D. Wang, H. Tan and Y. Li	
Nanoforming of Metallic Glass with Nano-Scale Die Fabricated by Focused Ion Beam	291
Y. Saotome, S. Okaniwa, T. Zhang and A. Inoue	
Phase Transformation and Microstructure Change in Fe-Zr-B Amorphous Alloys by Thermal Annealing and Electron Irradiation	295
Y. Umakoshi and T. Nagase	
Transition Metal and Transition Metal Fluorides as Catalysts in MgH₂-Based Nanocomposites	299
W.J. Botta Filho, J.F.R.d. Castro, G. Vaughan and A.R. Yavari	
Short-Range Order in Metastable Co₇₅Pd₂₅ Melts	305
D. Holland-Moritz, T. Schenk, V. Simonet, R. Bellissent and D.M. Herlach	
Electrochemical Storage of Hydrogen in Mg-Nanocomposites: Influence of the FeF₃ Catalyst	311
C. Poinsignon, A. Borissova, J.F.R.d. Castro, F. Aguey and A.R. Yavari	
Hydrogen Permeation Characteristics and Structural Features of Melt-Spun Ni-Nb-Zr Amorphous Alloy Membranes	315
S. Yamaura, K. Wakoh, H. Kimura, E. Matsubara, A. Inoue, Y. Shimpo, M. Nishida and O. Kajita	
Chemical State of Ti Atoms in NaAlH₄ Doped with a Ti-Based Precursor by Ball Milling	319
A. Léon, O. Kircher, J. Rothe and M. Fichtner	
Fracture Toughness in Zr-Based Bulk Metallic Glass	323
F. Kazutaka, N. Nishiyama, K. Amiya, T. Zhang, H. Kimura and A. Inoue	
Modeling of Crystallization Kinetics of Bulk Amorphous Alloys during Cooling	327
S.B. Lee and N.J. Kim	
Finite Element Simulations for Hot Forming of Bulk Amorphous Alloys	331
Y.S. Lee	
Effect of Yttrium Addition on the Formation of Ti-Zr-Ni Quasicrystal	335
A. Matsumoto, K. Kobayashi, T. Nishio and K. Ozaki	
Local Structures of Zr-Based Metallic Glasses in Terms of Quasicrystal Formation and Stability of Supercooled Liquid State	339
J. Saida, M. Imafuku, S. Sato, E. Matsubara and A. Inoue	
Characterization of Hydrogen Storage Alloy Mg₂Co Synthesized by Bulk Mechanical Alloying	343
Y.J. Wang, T. Aizawa and C. Nishimura	
Solid-State Synthesis of Mg₂Si_{1-x}Y_x (Y=Ge and Sn) Thermoelectric Materials via Bulk Mechanical Alloying	347
R.B. Song, T. Aizawa, A. Yamamoto and T. Obara	
Transformation between Nanocrystalline and Amorphous Phases in Zr-X Alloys during Accumulative Roll Bonding	351
P.J. Hsieh, J.C. Huang, J.S.C. Jang and C.Y.A. Tsao	
Cu-Hf-Ti-(Mo, Nb, Ta) Bulk Glassy Alloys with High Corrosion Resistance and High Strength	355
C. Qin, W. Zhang, K. Asami, H. Kimura and A. Inoue	
Deformation Behavior of a Zr₅₅Al₁₀Ni₅Cu₃₀ Bulk Metallic Glass at High Temperatures	359
H.S. Shin, Y.-. Jung, K.H. Kim, J.H. Ahn, H. Kato and A. Inoue	
Development of Shear Bands in a Bulk Metallic Glass and Composite upon Cold Rolling	363
J.S. Park, H.K. Lim, J.H. Kim, J.M. Park, H.J. Chang, W.T. Kim and D.H. Kim	
Die Casting and Properties Study of a Bulk Amorphous Zr_{38.5}Cu_{15.25}Ni_{9.75}Ti_{16.5}Be₂₀	367
S. Wu and C. Tu	
Fabrication of Bulk Amorphous Alloy Sheets by Strip Casting	371
J.G. Lee, S.S. Park, S.B. Lee, H. Chung and N.J. Kim	
Friction and Wear Behavior of Laser Irradiated Amorphous Metal	375
M. Tsujikawa, D. Azuma, M. Hino, H. Kimura and A. Inoue	
Effect of Carbon Addition on the Thermal Stability and Glass Forming Ability of Misch Metal-Based Bulk Metallic Glass Matrix Composites	379
J.H. Kim, J.S. Park, H.T. Jeong, H.J. Chang, W.T. Kim and D.H. Kim	

Mechanical Modelling of Carbon Nanotube Reinforced Metal Matrix Composites	383
Y.G. Jeong, M.H. Seo, S.C. Yoon, S.I. Hong and H.S. Kim	
Environmental Stability of Zr-Based Glass-Matrix Composites	387
A. Gebert, U. Kühn, A.A. Kündig, N. Radtke and L. Schulte	
High Temperature Oxidation-Sulfidation of Cr-ZrO₂-Al₂O₃ Composite Fabricated by Mechanical Alloying and Spark Plasma Sintering	391
A. Martínez-Villafañe, U. Arce-Colunga, V.M. Orozco-Carmona, C. Gaona-Tiburcio, R.A. Saucedo-Acuña, R. Martínez-Sánchez and S.D. De la Torre	
In Situ Formed Cu-Based Nanocomposite by Hot Pressing of Mechanically Alloyed Cu-Zr-Ti Composites Containing WC Particles as a Second Phase	395
C.C. Wang, J.S. Chen, R.R. Jen and P.Y. Lee	
Preparation of Pt-YSZ Nanocomposites by MOCVD and Their Electrochemical Properties	399
A.M. Torres-Huerta and J.R. Vargas-García	
Quality of Compaction and Microhardness of Bulk Nanocrystalline Al₈₈Mm₅Ni₅Fe₂ Alloy Consolidated at High Pressure	403
H. Dimitrov, J. Latuch, G. Cieślak and T. Kulik	
Formation of High-Quality Nanocrystalline Ni-W Electrodeposits by Using a Multi-Anode Type Electrode	407
H. Matsuoka, T. Okada, T. Yamasaki and T. Fukami	
High-Strength Nanocrystalline Ni-W Electrodeposits and Their Precision Forming at High Temperatures	411
N. Oda, H. Matsuoka, T. Yamasaki and T. Fukami	
Structural and Hydriding Properties of the Mg-Ni-H System with Nano- and/or Amorphous Structures	415
K. Ikeda, Y. Nakamori and S. Orimo	
Structure and Hydrogen Absorption Property of Mg₂Ni-Ti Alloy Powders Prepared by Mechanical Alloying	419
C.K. Lin, C.K. Wang, H.C. Lin and P.Y. Lee	
Bulk Ferromagnetic (Fe_{0.87}Co_{0.13})_{71.5-x}Tb_{3.5}Nb_xB₂₅ Glassy Alloys with a High Glass-Forming Ability	423
Y. Long, R.C. Ye, Y.Q. Chang and F. Wan	
Quasi-Dislocation Dipole-Type Defects and Low Coercivity of Fe-Based Soft Magnetic Glassy Alloys	427
T. Bitoh, A. Makino and A. Inoue	
Soft Magnetic Properties of Amorphous Fe_{73-x}Nb_xAl₄Si₃B₂₀ Alloys	431
C.R.M. Afonso, C. Bolfarini, W.J. Botta Filho and C.S. Kiminami	
Characteristic of Oxidation and Color Properties of Mechanically-Alloyed and Pulsed-Current-Sintered Ti-Si Alloy by Heat Treatment	435
K. Ozaki, A. Matsumoto, T. Nishio and K. Kobayashi	
Crystal Structure of Iron-Palladium Alloys by Mechanical Alloying	439
H. Yabe and T. Kuji	
Depression of the Peritectic Melting Point of FeSn₂ in FeSn₂-FeSn Nanocomposites Produced by Mechanical Milling	443
Y.S. Kwon, J.S. Kim, K.B. Gerasimov and S.S. Avramchuck	
Influence of Particle Size on the Hydrogen Sorption Properties of Ball-Milled MgH₂ with Nb₂O₅ as Catalyst	447
A. Revesz, D. Fátay, D. Zander and T. Spassov	
Lead-Free Solder System Bi5-Ag3-Cu0.5-Sn Prepared by Mechanical Alloying	451
C. Carreño-Gallardo, I. Estrada-Guel, M. Neri-Flores and R. Martínez-Sánchez	
Mechanical Alloying of Titanium with Rare Gas (He, Ar and Xe)	455
T. Shiota and Y. Higo	
Phase Transformations in Ti-Zr-Ni Compositions by Mechanical Alloying and Annealing	459
Y.V. Zhernovenkova, T.A. Sviridova, S.D. Kaloshkin, J. Xu, V.V. Tcherdyntsev and I.A. Tomilin	
Stress Induced Formation of Stable & Metastable Phases in Semi-Crystalline Polymers during Cryogenic Mechanical Milling	463
M. Stranz, U. Köster and F. Katzenberg	
Preparation of Ti+Ti₆Si₂B+Ti₅Si₃ and Ti+Ti₆Si₂B+TiB Powders by High-Energy Ball Milling and Subsequent Heat Treatment	467
B.B. Fernandes, A.S. Ramos and P.A. Suzuki	

Nanocrystallization of Martensite Steels and Ti-6Al-4V Alloy by Shot Peening	471
Y. Todaka, M. Umemoto, Y. Watanabe and K. Tsuchiya	
Thermodynamic Approach for Predicting the Glass Forming Ability of Amorphous Alloys	475
D. Kim, B.J. Lee and N.J. Kim	
Frictional Behavior of Nanocrystalline-Amorphous Duplex Microstructures of Zr-Based Metallic Glass: An Atomic Force Microscopy Analysis	479
T. Benameur, K. Gammoudi, A.R. Yavari and A. Inoue	
Patterning of Self-Oriented Nanocrystals in an Amorphous Alloy under Focused Ion Beam Irradiation	483
Y. Kamibayashi, T. Kamikawa, K. Takashima and Y. Higo	
Temperature Dependence of Linear Expansion Coefficient in Metallic Glass Zr-Al-Cu-Ni	487
T. Fukami, H. Yamamoto, S. Sonobe, D. Okai, T. Yamasaki, T. Zhang and A. Inoue	
Influence of Be on the Glass Forming Ability and Thermal Stability of Al-Based Metallic Glasses	491
N. Tian, M. Ohnuma and K. Hono	
Thermal Stability, Microstructure and Mechanical Behavior around the Glass Transition Temperature of a Cu₆₀Zr₂₂Ti₁₈ Amorphous Alloy	495
A. Revesz, P. Henits, S. Hóbor and Z. Kovács	
Kinetic Analysis of Magnetically Assisted Formation of Cu(II) Ammonium Complex from Cu Nanoparticles	499
K. Hirose, S. Kitashima, M. Senna, M.A. Uimin and A.Y. Yermakov	
Anelasticity in FCC Nanocrystalline Metals	503
N. Yagi, A. Ueki, H. Mizubayashi and H. Tanimoto	
Refinement of Cu-Phthalocyanine Powder by Nozzle-Jeto Water Cavitation	507
K. Tokumitsu, H. Saijo, K. Majima, H. Kato and R. Yamamoto	
Formation of Quasicrystals in Zr-Ti-Nb-Cu-Ni-Al Alloys by Casting or Annealing	511
U. Kühn, J. Eckert, S. Scudino, A. Gebert, N. Radtke, N. Mattern and L. Schultz	
Fabrication and High Performance Characteristics of Metallic Glassy Alloy Tubes	515
C. Ma, N. Nishiyama and A. Inoue	
Microstructural Characterization of Rapidly Solidified Al-6.5%Si-4%Cu Alloy Powders Produced by Gas Atomization	519
C.F. Ferrarini, L.A. Bereta, W.J. Botta Filho, C.S. Kiminami and C. Bolfarini	
Atomic-Scale Structure of Si_xGe_{1-x} Solid Solutions	523
I. Yonenaga, M. Sakurai, M.H.F. Sluiter and Y. Kawazoe	
Deformation-Induced Mixing Reactions in Cu-Cd Multilayers	527
R.J. Hebert, G. Wilde and J.H. Perepezko	
Viscous Flow Forming of Zr-Based Bulk Metallic Glasses for Industrial Products	531
H. Soejima, N. Nishiyama, H. Takehisa, M. Shimanuki and A. Inoue	
Glass-Forming Ability and Magnetic Properties of (Fe,Co)-B-Si-Nb Bulk Glassy Alloys	535
A. Urata, K. Amiya and A. Inoue	
Structure and Mechanical Properties of Ti-Cu-Ni Cast Alloy with High-Strength	539
K. Amiya, H. Soejima, N. Nishiyama and A. Inoue	
Characterization of Super-Precision Microgear Made of Ni-Based Metallic Glass	543
M. Ishida, H. Takeda, N. Nishiyama, Y. Shimizu, K. Kita, Y. Saotome and A. Inoue	
Anomalous Crystallization Induced by Ultrasound in Pd_{42.5}Ni_{7.5}Cu₃₀P₂₀ Metallic Glass	547
T. Ichitsubo, E. Matsubara, K. Anazawa, N. Nishiyama, M. Naito and Y. Hirotsu	
Structure and Hydrogen Permeation of Ni-Nb-Zr Amorphous Alloy	551
M. Sakurai, S. Yamaura, K. Wakoh, E. Matsubara and A. Inoue	
The Contribution of Grain-Boundary Activity to Plasticity in Nanocrystalline Fe - The Effect of Grain-Boundary Relaxation	555
D. Jang and M. Atzmon	
Mechanically Alloyed MgB₂ Superconductors: Microstructure, Tape Formation and Critical Currents	559
L. Schultz, O. Perner, W. Hässler, C. Fischer, G. Fuchs, B. Holzapfel and J. Eckert	
Alloy Phase Formation in Isolated Nanometer-Sized Particles in the Sn-Pb System	565
H. Mori and J.G. Lee	
Comparison of Nanocrystallization in Steels by Ball Milling, Shot Peening and Drilling	571
M. Umemoto, Y. Todaka, Y. Watanabe, J.G. Li and K. Tsuchiya	

Deformation Behavior and Microstructure Development of Ultrafine Grained Iron	577
Y. Futamura, K. Kawasaki, H. Hidaka, T. Tsuchiyama and S. Takaki	
Effects of Mechanical Activation on the Synthesis of WC from Wolframite (FeWO_4) and Graphite	
J. Temuujin, M. Senna, T. Jadambaa and D. Byambasuren	581
Structural Changes in High Speed Steel Powders Subjected to Ball Milling	
D. Oleszak, A. Grabias and T. Kulik	585
Preparation of Noble Metal (Ru, Ir)-Carbon Nano-Composites by MOCVD as Catalytic Electrode for Oxygen Sensors	
T. Kimura, G. Suzuki and T. Goto	589
Formation Regularities of the Phases in Al Alloy Nanometer Powders by Gas Evaporation Technology	
H.G. Yan, Z.H. Chen, G. Chen and J. Chen	593
Giant Irradiation Effects in FCC Nanocrystalline Metals	
H. Tanimoto, N. Yagi and H. Mizubayashi	597
Nanocrystallization of Drill Hole Surface by High Speed Drilling	
Y. Todaka, M. Umemoto, J.G. Li and K. Tsuchiya	601
High Speed Transformation of Ni-C System from FCC to HCP Structure with Fluctuating Mill	
K. Tokumitsu and R. Yamamoto	605
Formation of Polymer Blends and Nano-Composites by Cryogenic Mechanical Milling	
M. Stranz, U. Köster and F. Katzenberg	609
Surface Amorphization of TiNi Shape Memory Alloy by Shot Peening	
K. Tsuchiya, H. Nakayama, Y. Todaka, M. Umemoto and K. Morii	615
Nanostructure and Texture of Ni and Ni/SiC Nanocomposites Coatings	
P. Ari-Gur, K. Alogab, A. Alamr, H. Alkhasawneh and S. Mirmiran	619
Preparation and Characterization of Nanocrystalline Noble Metal Films by MOCVD	
R. Martinez Guerrero, M.Z. Figueroa Torres, I.M. Montaño Zuñiga, E.M. Arce Estrada and J.R. Vargas-García	623
Microstructural Characterization of Spray Formed Al-9Si-3Cu-1Fe and Al-9Si-3Cu-1Fe + Al-4Si-4Fe Co-Deposited Alloy	
L.A. Bereta, C.S. Kiminami, W.J. Botta Filho and C. Bolfarini	627
Corrosion Behavior of NdFeB-Based Nanocrystalline Permanent Magnets	
A. Gebert, M. Rada, A. Kirchner, J. Lyubina, O. Guttfleisch and L. Schultz	631
Thermal Stability of Magnetic Properties of Nanocrystalline Fe-Co-Hf-Cu-B Alloys	
X.B. Liang, J. Ferenc, M. Kowalczyk, T. Kulik and A. Ślawska-Waniewska	635
Bulk Nanostructured Cu-2.5vol.%Al_2O_3 Alloy Synthesized Using High Energy Mechanical Milling	
D.L. Zhang, C.C. Koch, R.O. Scattergood and K. Youssef	639
Bulk Mechanical Alloying of Zr-Cu System by Accumulative Roll Bonding (ARB)	
N. Tsuji, S. Kato, S. Ohsaki, K. Hono and Y. Minamino	643
Is There Phases Separation in Cu₆₀Ti₂₀Zr₂₀ Alloy?	
J.Z. Jiang, W. Roseker, L. Gerward and G. Goerigk	647
XAFS Study on Solid State Amorphization Process of MgNi Alloys	
T. Nasu, Y. Nomura, M. Sakurai and T. Usuki	653
Crystallization Behaviour of Novel $(\text{Ti}_{33}\text{Zr}_{33}\text{Hf}_{33})_{100-x}(\text{Ni}_{50}\text{Cu}_{50})_x$ Alloys with X=48 to 55	
K.B. Kim, P.J. Warren, B. Cantor and J. Eckert	657
Electron Irradiation Induced Amorphization and Crystallization in Zr_{66.7}Cu_{33.3} Metallic Glass	
T. Nagase and Y. Umakoshi	661
Crystallization Behavior of Zr-Based Bulk Metallic Glass under Super High Magnetic Field	
M. Qi, X.D. Wang and D.Z. Yang	665
Mechanical Characterization of Cu₆₀Zr₂₂Ti₁₈ Bulk Metallic Glasses	
G. Alcalá, A. Concustell, S. Mato, T.G. Woodcock, A. Gebert, M.D. Baró and J. Eckert	669
(Fe,Co)-B-Si-Nb Bulk Glassy Alloys with High Glass-Forming Ability and Super-High Strength	
B.L. Shen, C.T. Chang and A. Inoue	673

Nanostructural Control by Additive Pd in Cast Zr₅₀Cu₄₀Al₁₀ Glassy Alloys with Good Fatigue Properties		
Y. Yokoyama, M. Nishijima, K. Hiraga, P.K. Liaw and A. Inoue		677
On the Structural Relaxation and Nanoindentation Studies of Changes in Free Volume in Zr-Based Bulk Metallic Glasses		
T. Benameur, A.R. Yavari, A. Inoue and B. Guelorget		681
Ca-Mg-Zn Bulk Metallic Glasses with Strong Glass-Forming Ability Synthesized under Air Atmosphere		
E.S. Park and D.H. Kim		687
Effect of Strain on the Crystallization Kinetics of Bulk Amorphous Alloys		
G.T. Bae, S.B. Lee, K.S. Lee, Y.W. Chang and N.J. Kim		691
Compositional Effect on the Stability of the Amorphous Phase in Al-La-Ni Alloys		
T. Biswas, S. Ranganathan and H. Kimura		695
High Strength Ti-Based Bulk Glassy Alloys with Distinct Ductility		
N. Nishiyama, C. Ma, H. Soejima, K. Amiya and A. Inoue		699
Structure and Properties of Rapidly Solidified and Mechanically Milled Nanostructured Al-Ni-Mm Alloys		
S.J. Hong, C. Suryanarayana and B.S. Chun		703
Deformation Mechanisms of Nanostructured Metallic Materials		
H.S. Kim		709
A New Method for Synthesizing Mg-Based Alloys by Hydrogen Treated Mechanical Alloying		
M. Matsuura, K. Konno and M. Yoshida		715
Preparation of Binary and Ternary Intermetallic Powders via a Novel Reaction Ball Milling Technique		
Z.H. Chen and D. Chen		719
Fabrication of a TiC/Ti₅Si₃ Nano-Grained Composite for Micro-Parts Using Pseudo-Superplastic Deformation by Non-Equilibrium PM Process		
N. Miyano, M. Yoshimoto, Y. Kumagai, K. Isonishi and K. Ameyama		723
Electric Erosion Behavior of Nanocomposites		
Y.S. Kwon, J.S. Kim, D.V. Dudina, O.I. Lomovsky, M.A. Korchagin and V.I. Mali		727