

Table of Contents

Preface

Platform Science and Technology for Advanced Magnesium Alloys Y. Kojima	3
Magnesium Alloys Development towards the 21st Century E. Aghion and B. Bronfin	19
Development, Processing and Applications Range of Magnesium Lithium Alloys H. Haferkamp, M. Niemeyer, R. Boehm, U. Holzkamp, C. Jaschik and V. Kaese	31
Non-Basal Slips in Magnesium and Magnesium-Lithium Alloy Single Crystals S. Ando and H. Tonda	43
Ab Initio Study on the Structure of Mg-Li Alloys T. Uesugi, M. Kohyama, M. Kohzu and K. Higashi	49
Tensile Properties and Formability of Mg-Li Alloys Grain-Refined by ECAE Process S. Kamado, T. Ashie, Y. Ohshima and Y. Kojima	55
Improvement of Tensile Properties of Wrought Magnesium Alloys by Grain Refining S. Kamado, T. Ashie, H. Yamada, K. Sanbun and Y. Kojima	65
Heat Resistance of Mg-Zn-Al-Ca Alloy Castings I.A. Anyanwu, S. Kamado, T. Honda, Y. Kojima, S. Takeda and T. Ishida	73
High Temperature Strength of Semi-Solid Formed Mg-Zn-Al-Ca Alloys R.S. Rudi, S. Kamado, N. Ikeya, T. Araki and Y. Kojima	79
Tensile Properties of a P/M Mg-5Y-6Re Alloy K. Nakashima, H. Iwasaki, T. Mori, T. Mohri, M. Mabuchi, M. Nakamura, T. Asahina and K. Higashi	87
Deformation Mechanisms in a Mg-4Y-3RE Alloy R. Kariya, H. Iwasaki, T. Mori, T. Mohri, M. Mabuchi, M. Nakamura, T. Asahina and K. Higashi	93
Ductility Enhancement in Magnesium Alloys under Dynamic Loading T. Mukai, M. Yamanoi and K. Higashi	97
Mechanical Properties of Rapidly Solidified Mg-Zn Alloys J. Koike, Y. Kawamura, K. Hayashi, M. Suzuki, K. Maruyama and K.B. Kim	105
High Strength Nanocrystalline Mg-Al-Ca Alloys Produced by Rapidly Solidified Powder Metallurgy Processing Y. Kawamura, K. Hayashi, J. Koike, A. Kato, K.B. Kim and T. Masumoto	111
Structure and Mechanical Properties of Rapidly Solidified Mg-X Alloys K. Hayashi, Y. Kawamura, J. Koike, K. Higashi and K.B. Kim	117
Influence of Ni, Cu, Zn and Al Additions on Glass-Forming Ability and Mechanical Properties of Mg-Y-Mm (Mm=Mischmetal) Alloys D.V. Louzguine-Luzgin, Y. Kawamura and K.B. Kim	123
Development of Creep Resistant Magnesium Diecasting Alloys M.O. Pekguleryuz	131
Creep Resistance of Die-Cast Mg-Al-Base Alloys W. Blum, P. Zhang, B. Watzinger, B. v. Grossmann, H. Lipowski and H.-. Haldenwanger	141
Effects of Yttrium on Creep Behavior and Deformation Substructures of Magnesium M. Suzuki, R. Inoue, M. Sugihara, H. Sato, J. Koike, K. Maruyama and H. Oikawa	151
Grain Refinement of Commercial Magnesium Alloys for High-Strain-Rate-Superplastic Forming T. Mukai, H. Watanabe and K. Higashi	159
Superplastic Behavior in Commercial Wrought Magnesium Alloys H. Watanabe, H. Tsutsui, T. Mukai, I. Kunio, Y. Okanda, M. Kohzu and K. Higashi	171
The Press Formability in Magnesium Alloy AZ31 H. Somekawa, M. Kohzu, S. Tanabe and K. Higashi	177
Deformation Behavior of Mg Alloy Single Crystals at Various Temperatures S. Miura, S. Yamamoto, K. Ohkubo and T. Mohri	183
Clarification of Grain Refining Mechanisms of Superheat-Treated Mg-Al-Zn Alloy Castings T. Motegi, E. Yano, Y. Tamura and E. Sato	191

Effect of Minor Elements on Grain Size of Mg-9%Al Alloy Y. Tamura, T. Motegi, N. Kono and E. Sato	199
Application of Semi-Solid Forming to Mg-Zn-Al-Ca Alloys S. Kamado, N. Ikeya, R.S. Rudi, T. Araki and Y. Kojima	205
Mechanical Properties and Microstructure of Magnesium Alloys Composites Fabricated by Casting G. Sasaki, M. Yoshida, J. Pan, N. Fuyama, T. Fujii and H. Fukunaga	215
Effect of Triazine Dithiols on the Polymer Plating of Magnesium Alloys K. Mori, H. Hirahara, Y. Oishi and N. Kumagai	223
Formation of Magnesium Films on Magnesium Alloys by Vapor Deposition Technique H. Tsubakino, A. Watanabe, A. Yamamoto and S. Fukumoto	235
AFM Observations of Microstructures of Deposited Magnesium on Magnesium Alloys A. Yamamoto, A. Watanabe, H. Tsubakino and S. Fukumoto	241
Surface Modification of Magnesium Base Alloys by Gas/Plasma Nitridation T. Aizawa, H. Kuwahara and L. Tachai	247
Surface Modification by Dispersion of Hard Particles on Magnesium Alloy with Laser H. Hiraga, T. Inoue, Y. Kojima, S. Kamado and S. Watanabe	253
Corrosion and Protection of Magnesium Alloys E. Ghali	261
Structure and Corrosion Behavior of Conversion Coatings on Magnesium Alloys H. Umehara, S. Terauchi and M. Takaya	273
Stress Corrosion in Mg-Al-Mn Alloy Discussed with Measured Stress Distributions S.I. Tanaka and S. Iwata	283
Electrochemical Behavior of Impurity Elements in Magnesium Electrolysis T. Takenaka, T. Fujita and M. Kawakami	291
Solid-State Synthesis of Magnesium Base Alloys T. Aizawa	299
Thermodynamic Properties of Mg_{2.0}Ni Hydrides T. Kuji, H. Nakano and T. Aizawa	311
Preparation and Protium Absorbing Properties of Mg-Based Ternary Alloys H. Takamura, T. Amemiya, A. Kamegawa and M. Okada	315
Protium Absorbing and Desorbing Characteristics of Mg₂Ni-Mn Alloy H. Okumura, S. Kamado, T. Tabata, A. Matsui and Y. Kojima	321
Thermal Stability of Hydrides of Magnesium-Transition Metal System Prepared under a High Pressure H. Kakuta, A. Kamegawa, H. Takamura and M. Okada	329
Solid-State Synthesis of Mg₂Si via Bulk Mechanical Alloying T. Aizawa and K. Ichige	333
Applications of Magnesium Alloys for Aerospace Structure Systems H. Furuya, N. Kogiso, S. Matunaga and K. Senda	341
Surface Reaction of Magnesium in Hank's Solutions H. Kuwahara, Y. Al-Abdullat, M. Ohta, S. Tsutsumi, K. Ikeuchi, N. Mazaki and T. Aizawa	349
Mechanical Properties of Cellular Magnesium Materials C.E. Wen, Y. Yamada, K. Shimojima, M. Mabuchi, M. Nakamura and T. Asahina	359