

REFERENCES

REFERENCES

- [1] C. Blawert, N. Hort, and K. U. Kainer, "Automotive Applications of Magnesium and Its Alloys," *Trans. Indian Inst. Met.*, vol. 57, no. 4, pp. 397–408, 2004.
- [2] D. J. Lloyd, "Particle reinforced aluminium and magnesium matrix composites," *Int. Mater. Rev.*, vol. 39, no. 1, pp. 1–23, 1994.
- [3] D. M. Lee, B. K. Suh, B. G. Kim, S. Lee, and C. H. Lee, "~ C," vol. 13, no. July, pp. 590–595, 1997.
- [4] M. Gupta, M. O. Lai, and D. Saravananathan, "Synthesis , microstructure and properties characterization of disintegrated melt deposited Mg / SiC composites," vol. 5, pp. 2155–2165, 2000.
- [5] S. F. Hassan and M. Gupta, "Development of high strength magnesium copper based hybrid composites with enhanced tensile properties," *Mater. Sci. Technol.*, vol. 19, no. 2, pp. 253–259, 2003.
- [6] C. B. Wilson, K. G. Clausus, matthew R. Earlam, and J. E. Hillis, "Magnesium and magnesium alloys," in *Kirk-Othmer Encyclopedia of Chemical Technology*, 4th ed., Kirk-Othmer, Ed. Wiley-Interscience, 1995, pp. 313–337.
- [7] M. E. Henstock, "Recycling of non-ferrous metals," *Miner. Energy - Raw Mater.*, vol. 12, no. 1, pp. 37–38, 1996.
- [8] U.S. Geological Survey, *Mineral commodity summaries-2004*. Washington, DC, 20014.
- [9] U. S. G. Survey, *Mineral commodity summaries 2014*. Washington, DC: USGS, 2014.
- [10] C. Moosbrugger, "Introduction to magnesium alloy," in *Engineering Properties of Magnesium Alloys*, ASM International, 2017, pp. 1–9.
- [11] B. L. Mordike and T. Ebert, "Magnesium Properties - applications - potential," *Mater. Sci. Eng. A*, vol. 302, no. 1, pp. 37–45, 2001.
- [12] I. A. Ibrahim, F. A. Mohamed, and E. J. Lavernia, "Particulate reinforced metal matrix composites - a review," *J. Mater. Sci.*, vol. 26, no. 5, pp. 1137–1156, 1991.
- [13] K. U. Kainer, "Basics of Metal Matrix Composites," in *Metal Matrix Composites: Custom-made Materials for Automotive and Aerospace Engineering*, K. U. Kainer, Ed. Wiley-VCH Verlag GmbH & Co, 2006, pp. 1–54.
- [14] A. C. Serrenho, J. B. Norman, and J. M. Allwood, "The impact of reducing car weight on global emissions: The future fleet in Great Britain," *Philos. Trans. R.*

- Soc. A Math. Phys. Eng. Sci.*, vol. 375, no. 2095, 2017.
- [15] D. Mackenzie, J. Heywood, and S. Zoepf, “Determinants of U . S . passenger car weight,” *Int. J. Veh. Des.*, vol. 65, no. 1, pp. 73–93, 2014.
- [16] M. J. F. Gándara, “RECENT GROWING DEMAND FOR MAGNESIUM IN THE AUTOMOTIVE INDUSTRY,” *Mater. Technol.*, vol. 45, no. 6, pp. 633–637, 2011.
- [17] A. A. Nayeb-Hashemi and J. B. Clark, *Phase Diagram of Binary Magnesium Alloys*. Metals Park, Ohio : ASM International, 1988, 1988.
- [18] M. Avedesian and H. Baker, “ASM Specialty Handbook:Magnesium and Magnesium Alloys,” *ASM International, Materials Park, OH*. p. 314, 1999.
- [19] W. D. Callister and D. G. Rethwisch, *Materials Science and Engineering :An Introduction*. 2010.
- [20] J. F. King, “Magnesium: commodity or exotic?,” *Mater. Sci. Technol.*, vol. 23, no. 1, pp. 1–14, 2007.
- [21] M. K. Kulekci, “Magnesium and its alloys applications in automotive industry,” *Int. J. Adv. Manuf. Technol.*, vol. 39, no. 9–10, pp. 851–865, 2008.
- [22] A. a Luo, “Magnesium Front End Research and Development (MFERD),” *Mater. Soc. Annu. Meet.*, pp. 1–19, 2008.
- [23] F. Bechmann *et al.*, “Reinforced Light Metals for Automotive Applications.”
- [24] D. S. Kumar, C. T. Sasanka, K. Ravindra, and S. K.N.S, “Magnesium and Its alloy in Automotive Applications-A Review,” *Am. J. Mater. Sci. Technolgy*, vol. 4, no. 1, pp. 12–30, 2015.
- [25] J. Idris, J. C. Tan, and C. W. Chang, “The Development of Advanced Materials - High Performance Properties of Composite for Automotive and Aerospace Applications,” *Pertanika J. Sci. Techno\ Suppl.*, vol. 9, no. 2, pp. 149–158, 2001.
- [26] R. E. Brown, “Future of Magnesium Developments in 21st Century,” in *Presentation at Materials Science and Technology Conference*, 2008.
- [27] J. J. Kim and D. S. Han, “Recent Development and Applications of Magnesium Alloys in the Hyundai and Kia Motors Corporation,” *Mater. Trans.*, vol. 49, no. 5, pp. 894–897, 2008.
- [28] R. E. Brown and E. Lee, “Magnesium Usage Grew Rapidly in 1930-1950,” in *9th International Conference on Magnesium Alloys and Their Applications*, 2012, pp. 453–460.
- [29] B. R. Powell, P. E. Krajewski, and A. A. Luo, “Magnesium alloys for lightweight powertrains and automotive structures,” in *Materials, design and manufacturing for lightweight vehicles*, P. K. Mallick, Ed. Abington Hall,

- Granta Park, Great Abington, Cambridge CB21 6AH, UK: Woodhead Publishing Limited, 2010, pp. 114–168.
- [30] E. F. Emley, *Principles of magnesium technology*. Pergamon Press, 1966.
- [31] K. U. Kainer and F. von Buch, “The current state of technology and potential for further development of magnesium applications,” in *Magnesium – Alloys and Technology*, 2003, pp. 1–22.
- [32] D. MAGERS, “EINSATZMOEGELICHKEITEN VON MAGNESIUM IM AUTOMOBILBAU,” *Stuttgart: Franckh-Kosmos*, pp. 10–13, 1995.
- [33] “Automotive uses of magnesium alloys,” *Total Materia*, 2018. [Online]. Available: <https://www.totalmateria.com/page.aspx?ID=CheckArticle&site=ktn&NM=246>. [Accessed: 25-Aug-2018].
- [34] L. Ostrovsky and Y. Henn, “Present state and future of magnesium application in aerospace industry,” in *Internation conference on “New Challenges in Aeronautics” ASTEC 07*, 2007, pp. 1–5.
- [35] G. D. Wardlow, “A Changing world with different rule- New Opportunities for Magnesium Alloys?,” in *IMA 64th Annual World Magnesium Conference*, 2007.
- [36] J. E. Hillis, “The Effects of Heavy Metal Contamination on Magnesium Corrosion Performance,” *SAE Trans.*, vol. 92, no. 2, pp. 553–559, 1983.
- [37] “Magnesium uses.” [Online]. Available: <http://metalpedia.asianmetal.com/metal/magnesium/application.shtml>. [Accessed: 25-Aug-2018].
- [38] A. Dziubinska and A. Gontarz, “A new method for producing magnesium alloy twin-rib aircraft brackets,” *Aircr. Eng. Aerosp. Technol. An Int. J.*, vol. 87, no. 2, pp. 180–188, 2015.
- [39] “Discover More About Magnesium Alloys.” [Online]. Available: <https://www.magnesium-elektron.com/>. [Accessed: 10-Jul-2017].
- [40] H. E. Friedrich and B. L. Mordike, *Magnesium technology: Metallurgy, design data, applications*. 2006.
- [41] Mr. Che Cheng Yeh, “Lightweight alloy applications to the Sports and Leisure Industry.” [Online]. Available: http://www.sports.org.tw/e/report_main.asp?a_table=03lightweight. [Accessed: 25-Aug-2018].
- [42] E. D. McBride, “Absorbable metal in bone surgery: A FURTHER REPORT ON THE USE OF MAGNESIUM ALLOYS,” *J. Am. Med. Assoc.*, vol. 111, no. 27, pp. 2464–2467, 1938.
- [43] M. P. Staiger, A. M. Pietak, J. Huadmai, and G. Dias, “Magnesium and its alloys as orthopedic biomaterials: A review,” *Biomaterials*, vol. 27, no. 9, pp. 1728–

- 1734, 2006.
- [44] Y. Song, D. Shan, R. Chen, F. Zhang, and E. H. Han, “Biodegradable behaviors of AZ31 magnesium alloy in simulated body fluid,” *Mater. Sci. Eng. C*, vol. 29, no. 3, pp. 1039–1045, 2009.
- [45] “Impact of materials on society (IMOS)-Magnesium Alloy.” [Online]. Available: <https://www.youtube.com/watch?v=vIWH3N9HrHY>. [Accessed: 25-Aug-2017].
- [46] B. Landkof, “Magnesium Applications in Aerospace and Electronic Industries,” in *Magnesium Alloys and their Applications*, 2000, pp. 168–172.
- [47] Morio, “ELECTRONIC APPLICATIONS.” [Online]. Available: https://www.intlmag.org/page/app_electronic_ima. [Accessed: 25-Aug-2018].
- [48] W. A. Monteiro, “The Influence of Alloy Element on Magnesium for Electronic Devices Applications—A Review,” in *Light Metal Alloys Applications*, vol. 12, 2014, pp. 229–241.
- [49] “STIHL.” [Online]. Available: <https://blog.stihl.com/products/2017/11/stihl-magnesium-diecasting-plant/>. [Accessed: 10-Sep-2018].
- [50] “Magnesium die casting.” [Online]. Available: <https://www.spotlightmetal.com/thinking-in-terms-of-magnesium-magnesium-pressure-die-casting-is-completely-in-the-trend-a-660295/>. [Accessed: 10-Sep-2018].
- [51] “Magnesium alloy,” 2018. [Online]. Available: http://www.wikiwand.com/en/Magnesium_alloy. [Accessed: 10-Sep-2018].
- [52] S. Schumann and H. Friedrich, “Engineering Requirements, Strategies and Examples,” in *Magnesium Technology: Metallurgy, Design Data, Applications*, 2006, pp. 499–629.
- [53] Oakley Inc., “Magnesium eyewear.” [Online]. Available: <https://www.oakley.com/en-us/category/men/sunglasses/sport-performance>. [Accessed: 28-Aug-2018].
- [54] K. U. Kainer, *Magnesium: Proceedings of the 6th International Conference Magnesium Alloys and Their Applications*. 2003.
- [55] K. Norman, “APPARATUS FOR MELTING FINELY DIVIDED ALUMINUM AND ALLOYS OTHER METALS,” 488354, 1946.
- [56] F. Czerwinski, *Magnesium Alloys - Design, Processing and Properties*. 2011.
- [57] N. A. D. C. Association, *Magnesium die casting handbook*. North American die Casting Association, 1998.
- [58] A. A. Luo, “Recent magnesium alloy development for elevated temperature applications,” *Int. Mater. Rev.*, vol. 49, no. 1, pp. 13–30, 2004.

- [59] M. O. Pekguleryuz and A. A. Kaya, “Creep resistant magnesium alloys for powertrain applications,” *Adv. Eng. Mater.*, vol. 5, no. 12, pp. 866–878, 2003.
- [60] C. Suman, “Creep of Diecast Magnesium Alloys AZ91D and AM60B,” in *SAE Technical Paper 910416*, 1991, p. 12.
- [61] B. R. Powell, A. a Luo, V. Rezhets, J. J. Bommarito, and B. L. Tiwari, “Development of Creep-Resistant Magnesium Alloys for Powertrain Applications : Part 1 of 2,” *Pap. Pap. 19902002*, vol. 110, no. 724, pp. 406–413, 2001.
- [62] W. E. Mercer, “Magnesium Die cast Alloys for Elevated Temperature Applications,” in *SAE Technical*, 1990, p. 15.
- [63] B. R. Powell, V. Rezhets, A. A. Luo, and B. L. Tiwari, “CREEP-RESISTANT MAGNESIUM ALLOY DE CASTINGS,” US 6,264,763 B1, 2001.
- [64] J. R. Davis, *Alloying: Understanding the basics*. 2001.
- [65] S. F. Hassan and M. Gupta, “Development of a novel magnesium–copper based composite with improved mechanical properties,” *Mater. Res. Bull.*, vol. 37, no. 2, pp. 377–389, 2002.
- [66] W. L. E. Wong and M. Gupta, “Development of Mg/Cu nanocomposites using microwave assisted rapid sintering,” *Compos. Sci. Technol.*, vol. 67, no. 7–8, pp. 1541–1552, 2007.
- [67] W. H. Sillekens, S. R. Agnew, and S. N. Neelameggham, Neale R. Mathaudhu, “Magnesium Technology 2011,” in *Proceedings of a symposium sponsored by the Magnesium Committee of the Light Metals Division of The Minerals, Metals & Materials Society (TMS)*, 2011, vol. 1, no. 3, pp. 1–31.
- [68] S. F. Hassan and M. Gupta, “Development of a novel magnesium/nickel composite with improved mechanical properties,” *J. Alloys Compd.*, vol. 335, no. 1–2, pp. 10–15, 2002.
- [69] H. Proffitt, “Magnesium and Magnesium Alloys,” in *ASM Handbook Vol 15*, Haley Industries Ltd., Canada, 1992, pp. 1755–1767.
- [70] K. U. Kainer, *Magnesium-Alloys and Technologies*. 2003.
- [71] ASTM B296-03 (2014), “Standard Practice for Temper Designations of Magnesium Alloys, Cast and Wrought,” West Conshohocken, PA, 2014.
- [72] Z. Xiaoqin, W. Qudong, L. Yizhen, Z. Yanping, D. Wenjiang, and Z. Yunhu, “Influence of beryllium and rare earth additions on ignition-proof magnesium alloys,” *J. Mater. Process. Technol.*, vol. 112, no. 1, pp. 17–23, 2001.
- [73] J. A. S. Tenorio and D. C. R. Espinosa, “High-Temperature Oxidation of Al – Mg Alloys,” *Oxid. of Metals*, vol. 53, no. 3–4, pp. 361–373, 2000.
- [74] U. S. E. P. Agency, “Alternatives to SF6 for magnesium melt protection,” 2016.

- [Online]. Available: https://www.epa.gov/sites/production/files/2016-02/documents/magbrochure_english.pdf. [Accessed: 02-Sep-2018].
- [75] L. S. Sin, A. Elsayed, and C. Ravindran, “Inclusions in magnesium and its alloys: a review,” *Int. Mater. Rev.*, vol. 58, no. 7, pp. 419–436, 2013.
- [76] A. A. Luo, “Magnesium casting technology for structural applications,” *J. Magnes. Alloy.*, vol. 1, no. 1, pp. 2–22, 2013.
- [77] J. Stringer, “The reactive element effect in high-temperature corrosion,” *Mater. Sci. Eng. A*, vol. 120–121, no. PART 1, pp. 129–137, 1989.
- [78] F. Czerwinski, “The reactive element effect on high-temperature oxidation of magnesium,” *Int. Mater. Rev.*, vol. 60, no. 5, pp. 264–296, 2015.
- [79] M. J. Balart, J. B. Patel, and Z. Fan, “Melt Protection of Mg-Al Based Alloys,” *Metals (Basel)*, vol. 6, no. 6, p. 131, 2016.
- [80] S. M. Howard, “Ellingham Diagrams,” *South Dakota School of Mines and Technology*, 2006. [Online]. Available: http://showard.sdsmt.edu/MET320/Handouts/EllinghamDiagrams/Ellingham_v2_2_Macro.pdf.
- [81] M. Sakamoto, S. Akiyama, and K. Ogi, “Suppression of ignition and burning of molten Mg alloys by Ca bearing stable oxide film,” *J. Mater. Sci. Lett.*, vol. 16, no. 12, pp. 1048–1050, 1997.
- [82] J. F. King, “Environmental Challenges Facing the Magnesium Industry SF6 Replacement,” in *60th Annual World Magnesium Conference*, 2003, pp. 10–16.
- [83] M. Holtzer and A. Bobrowski, “Magnesium melt protection by covering gas,” *Arch. foundry Eng.*, vol. 8, no. 1, pp. 131–136, 2008.
- [84] N. J. Ricketts and S. P. Cashion, “Hydrofluorocarbons as a replacement for sulphur hexafluoride in magnesium processing,” in *Magnesium Technology 2001*, Warrendale, PA, TMS, 2001, pp. 31–36.
- [85] D. S. Milbrath, “Development of 3M Novec 612 Magnesium Protection Fluid as a Substitute for SF 6 over Molten Magnesium,” in *2nd International Conference on SF6 and the Environment*, 2002.
- [86] N. Chawla and K. K. Chawla, *METAL MATRIX COMPOSITES*. New York, 2006.
- [87] M. Gupta and N. M. L. Sharon, *Magnesium, Magnesium Alloys, and Magnesium Composites*. New Jersey: John Wiley & Sons, Inc, 2010.
- [88] P. Babaghorbani, S. M. L. Nai, and M. Gupta, “Development of lead-free Sn-3.5Ag/SnO₂ nanocomposite solders,” *J. Mater. Sci. Mater. Electron.*, vol. 20, no. 6, pp. 571–576, 2009.
- [89] S. M. L. Nai, J. Wei, and M. Gupta, “Development of Lead-Free Solder

- Composites Containing Nanosized Hybrid ($ZrO_2 + 8 \text{ mol.}\% \text{ Y}_2O_3$) Particulates,” *Solid State Phenom.*, vol. 111, pp. 59–62, 2006.
- [90] S. M. L. Nai, J. Wei, and M. Gupta, “Improving the performance of lead-free solder reinforced with multi-walled carbon nanotubes,” *Mater. Sci. Eng. A*, vol. 423, no. 1–2, pp. 166–169, 2006.
- [91] T. W. Clyne and P. J. Withers, *An Introduction to Metal Matrix Composites*, First. Cambridge, 1993.
- [92] G. N. Hassold, E. A. Holm, and D. J. Srolovitz, “Effects of particle size on inhibited grain growth,” *Scr. Metall. Mater.*, vol. 24, no. 1, pp. 101–106, 1990.
- [93] K. K. Deng, K. Wu, Y. W. Wu, K. B. Nie, and M. Y. Zheng, “Effect of submicron size SiC particulates on microstructure and mechanical properties of AZ91 magnesium matrix composites,” vol. 504, pp. 542–547, 2010.
- [94] T. A. Adams II, “Physical Properties of Carbon Nano Tubes.” [Online]. Available: <https://web.pa.msu.edu/cmp/csc/ntproperties/>. [Accessed: 30-Aug-2018].
- [95] W. F. Gale and T. C. Totemeier, *Smithells Metal Reference Book*, Eighth edi. Elsevier Butterworth-Heinemann, 2004.
- [96] P. Babaghorbani, S. M. L. Nai, and M. Gupta, “Development of lead-free nanocomposite solders using oxide based reinforcement,” in *Processing and Engineering Applications of Novel Materials*, 2008, vol. 15, pp. 89–93.
- [97] R. E. Johnson, “Conflicts between Gibbsian Thermodynamics and Recent Treatments of Interfacial Energies in Solid-Liquid-Vapor,” *J. Phys. Chem.*, vol. 63, no. 10, pp. 1655–1658, 1959.
- [98] A. Mortensen, J. A. Cornie, and M. C. Flemings, “Solidification processing of metal-matrix composites,” *J. Met.*, vol. 40, no. 2, pp. 12–19, 1988.
- [99] K. K. Chawla, *Composite Materials: Science and Engineering*. Springer-Verlag New York, 2012.
- [100] J. M. Howe, “Bonding, structure, and properties of metal/ceramic interfaces: Part 1 Chemical bonding, chemical reaction, and interfacial structure,” *Int. Mater. Rev.*, vol. 38, no. 5, pp. 233–256, 1993.
- [101] M. Rühle and A. G. Evans, “Structure and chemistry of metal/ceramic interfaces,” *Mater. Sci. Eng. A*, vol. 107, no. C, pp. 187–197, 1989.
- [102] S. Suresh, A. Mortensen, and A. Needleman, *Fundamentals of Metal-Matrix Composites*. 1993.
- [103] N. Eustathopoulos and A. Mortensen, “Capillary phenomena, interfacial bonding, and reactivity,” in *Fundamentals of Metal-Matrix Composites*, S. Suresh, A. Mortensen, and A. Needleman, Eds. Boston, MA: Butterworth-

- Heinemann, 1993, pp. 42–58.
- [104] A. Mortensen and I. Jin, “Solidification Processing Of Metal Matrix Composites,” *Int. Mater. Rev.*, vol. 37, no. 3, pp. 101–128, 1992.
- [105] A. Needleman, S. R. Nutt, S. Suresh, and V. Tvergaard, “Matrix, reinforcement, and interfacial failure,” in *Fundamentals of Metal-Matrix Composites*, S. Suresh, A. Mortensen, and A. Needleman, Eds. Boston, MA: Butterworth-Heinemann, 1993, pp. 233–250.
- [106] S. R. Nutt and J. M. Duva, “A failure mechanism in AlSiC composites,” *Scr. Metall.*, vol. 20, no. 7, pp. 1055–1058, 1986.
- [107] S. R. Nutt and A. Needleman, “Void nucleation at fibre ends in Al -SiC Composites,” *Scr. Mater.*, vol. 21, pp. 705–710, 1987.
- [108] A. L. Geiger and J. A. Walker, “The processing and properties of discontinuously reinforced aluminum composites,” *J. Miner. Met. Mater. Soc.*, vol. 42, no. 8, pp. 8–15, 1991.
- [109] Lord Rayleigh, “LVI. On the influence of obstacles arranged in rectangular order upon the properties of a medium,” *Philosophical Magazine Series 5*, vol. 34, no. 211, pp. 481–502, 1892.
- [110] E H Kerner, “The Electrical Conductivity of Composite Media,” *Proc. Phys. Soc. London*, vol. B69, pp. 802–807, 1956.
- [111] W. L. E. Wong, S. Karthik, and M. Gupta, “Development of high performance Mg–Al₂O₃ composites containing Al₂O₃ in submicron length scale using microwave assisted rapid sintering,” *Mater. Sci. Technol.*, vol. 21, no. 9, pp. 1063–1070, 2005.
- [112] V. C. Nardone and K. M. Prewo, “On the strength of discontinuous silicon carbide reinforced aluminum composites,” *Scr. Metall.*, vol. 20, no. 1, pp. 43–48, 1986.
- [113] L. H. Dai, Z. Ling, and Y. L. Bai, “Size-dependent inelastic behavior of particle-reinforced metal-matrix composites,” *Compos. Sci. Technol.*, vol. 61, no. 8, pp. 1057–1063, 2001.
- [114] T. W. Clyne and P. J. Withers, *An Introduction to Metal Matrix Composites*. Cambridge University Press, 1993.
- [115] S. C. V Lim, M. Gupta, and L. Lu, “Processing , microstructure , and properties of Mg – SiC composites synthesised using fluxless casting process,” *Mater. Sci. Technol.*, vol. 17, no. 7, pp. 823–832, 2001.
- [116] A. R. Boccaccini, G. Ondracek, P. Mazilu, and D. Windelberg, “On the effective Young’s modulus of elasticity for porous materials: Microstructure modeling and comparison between calculated and experimental values,” *J. Mech. Behav. Mater.*, vol. 4, no. 2, pp. 119–128, 1993.

- [117] G. E. Fougere, L. Riester, M. Ferber, J. R. Weertman, and R. W. Siegel, "Young's modulus of nanocrystalline Fe measured by nanoindentation," *Mater. Sci. Eng. A*, vol. 204, pp. 1–6, 1995.
- [118] C. S. Goh, "Properties and deformation behaviour of Mg – Y₂O₃ nanocomposites," vol. 55, pp. 5115–5121, 2007.
- [119] C. S. Goh, J. Wei, L. C. Lee, and M. Gupta, "Development of novel carbon nanotube reinforced magnesium nanocomposites using the powder metallurgy technique," *Nanotechnology*, vol. 17, no. 1, pp. 7–12, 2006.
- [120] M. Kouzeli and A. Mortensen, "Size dependent strengthening in particle reinforced aluminium," *Acta Mater.*, vol. 50, no. 1, pp. 39–51, 2002.
- [121] Z. Zhang and D. L. Chen, "Consideration of Orowan strengthening effect in particulate-reinforced metal matrix nanocomposites: A model for predicting their yield strength," *Scr. Mater.*, vol. 54, no. 7, pp. 1321–1326, 2006.
- [122] R. J. Arsenault and N. Shi, "Dislocation generation due to differences between the coefficients of thermal expansion," *Mater. Sci. Eng.*, vol. 81, no. C, pp. 175–187, 1986.
- [123] N. Ramakrishnan, "An analytical study on strengthening of particulate reinforced metal matrix composites," *Acta Mater.*, vol. 44, no. 1, pp. 69–77, 1996.
- [124] X. L. Zhong, W. L. E. Wong, and M. Gupta, "Enhancing strength and ductility of magnesium by integrating it with aluminum nanoparticles," *Acta Mater.*, vol. 55, no. 18, pp. 6338–6344, 2007.
- [125] B. W. Chua, L. Lu, and M. O. Lai, "Influence of SiC particles on mechanical properties of Mg based composite," *Compos. Struct.*, vol. 47, no. 1–4, pp. 595–601, 1999.
- [126] J. Gu, X. Zhang, and M. Gu, "Mechanical properties and damping capacity of (SiC_p+ Al₂O₃·SiO₂f)/Mg hybrid metal matrix composite," *J. Alloys Compd.*, 2004.
- [127] Y. L. Xi, D. L. Chai, W. X. Zhang, and J. E. Zhou, "Titanium alloy reinforced magnesium matrix composite with improved mechanical properties," *Scr. Mater.*, vol. 54, no. 1, pp. 19–23, 2006.
- [128] L. J. Chang, J. H. Young, B. C. Jiang, J. S. C. Jang, J. C. Huang, and C. Y. A. Tsao, "MECHANICAL PROPERTIES OF THE MG-BASED AMORPHOUS/NANO ZIRCONIA COMPOSITE ALLOY."
- [129] Z. Száraz, Z. Trojanová, M. Cabbibo, and E. Evangelista, "Strengthening in a WE54 magnesium alloy containing SiC particles," *Mater. Sci. Eng. A*, 2007.
- [130] P. Poddar, V. C. Srivastava, P. K. De, and K. L. Sahoo, "Processing and mechanical properties of SiC reinforced cast magnesium matrix composites by stir casting process," *Mater. Sci. Eng. A*, vol. 460–461, pp. 357–364, 2007.

- [131] G. Cao, H. Choi, J. Oportus, H. Konishi, and X. Li, "Study on tensile properties and microstructure of cast AZ91D/AlN nanocomposites," *Mater. Sci. Eng. A*, 2008.
- [132] T. Honma, K. Nagai, A. Katou, K. Arai, M. Suganuma, and S. Kamado, "Synthesis of high-strength magnesium alloy composites reinforced with Si-coated carbon nanofibres," *Scr. Mater.*, vol. 60, no. 6, pp. 451–454, 2009.
- [133] D. V. Dudina *et al.*, "A magnesium alloy matrix composite reinforced with metallic glass," *Compos. Sci. Technol.*, 2009.
- [134] Z. Trojanová *et al.*, "Mechanical and fracture properties of an AZ91 Magnesium alloy reinforced by Si and SiC particles," *Compos. Sci. Technol.*, 2009.
- [135] P. K. Rohatgi, A. Daoud, B. F. Schultz, and T. Puri, "Microstructure and mechanical behavior of die casting AZ91D-Fly ash cenosphere composites," *Compos. Part A Appl. Sci. Manuf.*, vol. 40, no. 6–7, pp. 883–896, 2009.
- [136] K. Kondoh, H. Fukuda, J. Umeda, H. Imai, B. Fugetsu, and M. Endo, "Microstructural and mechanical analysis of carbon nanotube reinforced magnesium alloy powder composites," vol. 527, pp. 4103–4108, 2010.
- [137] E. Francis, N. E. Prasad, C. Ratnam, P. S. Kumar, and V. V. Kumar, "Synthesis of Nano Alumina Reinforced Magnesium-Alloy Composites," *Int. J. Adv. Sci. Technol.*, vol. 27, pp. 35–44, 2011.
- [138] X. J. Wang, K. B. Nie, X. J. Sa, X. S. Hu, K. Wu, and M. Y. Zheng, "Microstructure and mechanical properties of SiCp/MgZnCa composites fabricated by stir casting," *Mater. Sci. Eng. A*, vol. 534, pp. 60–67, 2012.
- [139] K. K. Deng, X. J. Wang, Y. W. Wu, X. S. Hu, K. Wu, and W. M. Gan, "Effect of particle size on microstructure and mechanical properties of SiCp/AZ91 magnesium matrix composite," *Mater. Sci. Eng. A*, 2012.
- [140] E. Bedolla, J. Lemus-Ruiz, and A. Contreras, "Synthesis and characterization of Mg-AZ91/AlN composites," *Mater. Des.*, 2012.
- [141] M. E. Alam, A. M. S. Hamouda, Q. B. Nguyen, and M. Gupta, "Improving microstructural and mechanical response of new AZ41 and AZ51 magnesium alloys through simultaneous addition of nano-sized Al₂O₃ particulates and Ca," *J. Alloys Compd.*, vol. 574, pp. 565–572, 2013.
- [142] A. Matin, F. F. Saniee, and H. R. Abedi, "Microstructure and mechanical properties of Mg / SiC and AZ80 / SiC nano-composites fabricated through stir casting method," *Mater. Sci. Eng. A*, vol. 625, pp. 81–88, 2015.
- [143] N. P. Suh, "An overview of the delamination theory of wear," *Wear*, vol. 44, pp. 1–16, 1977.
- [144] N. Suh, "The delamination theory of wear," *Wear*, vol. 25, no. 1, pp. 111–124, 1973.

-
- [145] Ernest Rabinowicz, *Friction and wear of materials*. New York : Wiley, 1965.
- [146] N. P. Suh and H. C. Sin, “The genesis of friction,” *Wear*, vol. 69, no. 1, pp. 91–114, 1981.
- [147] H. Sin, N. Saka, and N. P. Suh, “Abrasive wear mechanism and the grit size effect,” *Wea*, vol. 55, pp. 163–190, 1979.
- [148] Peter B. Madakson, “The frictional behaviour of materials,” *Wear*, vol. 87, no. 2, pp. 191–206, 1983.
- [149] Y. B. Liu, S. C. Lim, S. Ray, and P. K. Rohatgi, “Friction and wear of aluminium-graphite composites: the smearing process of graphite during sliding,” *Wear*, vol. 159, no. 2, pp. 201–205, 1992.
- [150] M. Nosonovsky and P. K. Rohatgi, *Biomimetics in Materials Science*. Springer Singapore, 2012.
- [151] F. P. Bowden, A. J. W. Moore, and D. Tabor, “The ploughing and adhesion of sliding metals,” *J. Appl. Phys.*, vol. 14, no. 2, pp. 80–91, 1943.
- [152] F. P. Bowden and D. Tabor, “The lubrication by thin metallic films and the action of bearing metals,” *J. Appl. Phys.*, vol. 14, no. 3, pp. 141–151, 1943.
- [153] M. Kawamoto and K. Okabayashi, “Study of dry sliding wear of cast iron as a function of surface temperature,” *Wear*, vol. 58, no. 1, pp. 59–95, 1980.
- [154] S. García-Rodríguez, B. Torres, A. Maroto, A. J. J. López, E. Otero, and J. Rams, “Dry sliding wear behavior of globular AZ91 magnesium alloy and AZ91/SiCp composites,” *Wear*, vol. 390–391, no. October 2016, pp. 1–10, Nov. 2017.
- [155] F. Rana and D. M. Stefanescu, “Friction properties of Al-1.5 Pct Mg/SiC particulate metal-matrix composites,” *Metall. Trans. A*, vol. 20, no. 8, pp. 1564–1566, 1989.
- [156] M. Roy, B. Venkataraman, V. V Bhanuprasad, Y. R. Mahajan, and G. Sundararajan, “The Effect of Particulate Reinforcement on the Sliding Wear Behavior of Aluminum Matrix Composites,” *Metall. Trans. A*, vol. 23A, no. October, pp. 2833–2847, 1992.
- [157] A. Sato and R. Mehrabian, “Aluminum matrix composites: Fabrication and properties,” *Metall. Trans. B*, vol. 7, no. 3, pp. 443–451, 1976.
- [158] M. K. Surappa, S. V. Prasad, and P. K. Rohatgi, “Wear and abrasion of cast Al-Alumina particle composites,” *Wear*, vol. 77, no. 3, pp. 295–302, 1982.
- [159] K. Anand and Kishore, “On the wear of aluminium-corundum composites,” *Wear*, vol. 85, no. 2, pp. 163–169, 1983.
- [160] Y. Iwai, H. Yoneda, and T. Honda, “Sliding wear behavior of Sic whisker-reinforced composite,” *Powder Metall.*, vol. 183, pp. 594–602, 1995.

- [161] J. . Archard, “Wear Theory and Mechanisms,” in *Wear control handbook*, M. B. Peterson and W. . Winer, Eds. New York: American Society of Mechanical Engineers, 1980, pp. 35–80.
- [162] C. Y. . Lim, S. . Lim, and M. Gupta, “Wear behaviour of SiCp-reinforced magnesium matrix composites,” *Wear*, 2003.
- [163] Q. C. Jiang, H. Y. Wang, B. X. Ma, Y. Wang, and F. Zhao, “Fabrication of B 4 C particulate reinforced magnesium matrix composite by powder metallurgy,” vol. 386, pp. 177–181, 2005.
- [164] M. juan ZHANG, X. hong YANG, Y. bing LIU, Z. yi CAO, L. ren CHENG, and Y. li PEI, “Effect of graphite content on wear property of graphite/Al₂O₃/Mg-9Al-1Zn-0.8Ce composites,” *Trans. Nonferrous Met. Soc. China (English Ed.*, vol. 20, no. 2, pp. 207–211, 2010.
- [165] M.-J. Zhang, Y.-B. Liu, X.-H. Yang, and K.-S. Luo, “Effect of graphite particle size on wear property of graphite and Al₂O₃ reinforced AZ91D-0.8%Ce composites.”
- [166] V. I. Semenov *et al.*, “Tribological properties of the AZ91D magnesium alloy hardened with silicon carbide and by severe plastic deformation,” *J. Frict. Wear*, vol. 30, no. 3, pp. 194–198, 2009.
- [167] A. K. Mondal and S. Kumar, “Dry sliding wear behaviour of magnesium alloy based hybrid composites in the longitudinal direction,” *Wear*, 2009.
- [168] L. Falcon-Franco, E. Bedolla-Becerril, J. Lemus-Ruiz, J. G. Gonzalez-Rodríguez, R. Guardian, and I. Rosales, “Wear performance of TiC as reinforcement of a magnesium alloy matrix composite,” *Compos. Part B Eng.*, 2011.
- [169] M. Srinivasan, C. Loganathan, M. Kamaraj, Q. B. Nguyen, M. Gupta, and R. Narayanasamy, “Sliding wear behaviour of AZ31B magnesium alloy and nanocomposite,” *Trans. Nonferrous Met. Soc. China (English Ed.*, 2012.
- [170] M. Gupta, M. O. Lai, and D. Saravananathan, “Synthesis , microstructure and properties characterization of disintegrated melt deposited Mg / SiC composites,” *J. Mater. Sci.*, vol. 35, pp. 2155–2165, 2000.
- [171] S. F. Hassan, “Effect of primary processing techniques on the microstructure and mechanical properties of nano-Y₂O₃reinforced magnesium nanocomposites,” *Mater. Sci. Eng. A*, vol. 528, no. 16–17, pp. 5484–5490, 2011.
- [172] S. Ugandhar, M. Gupta, and S. K. Sinha, “Effect of Hybrid Metallic and Ceramic Reinforcements on the Properties of Pure Magnesium,” *Solid State Phenom.*, vol. 111, pp. 79–82, 2006.
- [173] F. JIANG, K. HIRATA, T. MASUMURA, T. TSUCHIYAMA, and S. TAKAKI, “Effect of the Surface Layer Strained by Mechanical Grinding on X-ray Diffraction Analysis,” *ISIJ Int.*, vol. 58, no. 2, pp. 376–378, 2018.

- [174] ASTM E8 / E8M-16a, “Standard Test Methods for Tension Testing of Metallic Materials,” *ASTM International*, 2016. [Online]. Available: <https://www.astm.org/Standards/E8.htm>.
- [175] E.-09(2018) ASTM, “Standard Test Methods of Compression Testing of Metallic Materials at Room Temperature,” *ASTM International*, 2018. [Online]. Available: <https://www.astm.org/Standards/E9>.
- [176] ASTM G99 - 17, “Standard Test Method for Wear Testing with a Pin-on-Disk Apparatus,” *ASTM International*, 2017. [Online]. Available: <https://www.astm.org/Standards/G99>.
- [177] B. Abbasipour, B. Niroumand, and S. M. M. Vaghefi, “Compocasting of A356-CNT composite,” *Trans. Nonferrous Met. Soc. China*, vol. 20, no. 9, pp. 1561–1566, 2010.
- [178] M. Sahoo, I. Rout, and D. R. Patra, “Design and Fabrication of a Stir Casting Furnace Set-Up,” *Int. J. Eng. Res. Appl.*, vol. 5, no. 7, pp. 80–88, 2015.
- [179] S. K. Thandalama, S. Ramanathana, and S. Sundarrajanb, “Synthesis, microstructural and mechanical properties of ex situ zircon particles (ZrSiO₄) reinforced Metal Matrix Composites (MMCs): a review,” *J. Mater. Res. Technol.*, vol. 4, no. 3, 2015.
- [180] M. Gupta and W. L. E. Wong, “Magnesium-based nanocomposites: Lightweight materials of the future,” *Materials Characterization*, vol. 105. 2015.
- [181] S. F. Hassan and M. Gupta, “Effect of particulate size of Al₂O₃ reinforcement on microstructure and mechanical behavior of solidification processed elemental Mg,” vol. 419, pp. 84–90, 2006.
- [182] Y. Morisada, H. Fujii, T. Nagaoka, and M. Fukusumi, “Effect of friction stir processing with SiC particles on microstructure and hardness of AZ31,” vol. 433, pp. 50–54, 2006.
- [183] Q. B. Nguyen and M. Gupta, “Increasing significantly the failure strain and work of fracture of solidification processed AZ31B using nano-Al₂O₃ particulates,” vol. 459, pp. 244–250, 2008.
- [184] B. You, W. Park, and I. Chung, “THE EFFECT OF CALCIUM ADDITIONS ON THE OXIDATION BEHAVIOR IN MAGNESIUM ALLOYS,” vol. 42, pp. 1089–1094, 2000.
- [185] N. Hara, Y. Kobayashi, D. Kagaya, and N. Akao, “Formation and breakdown of surface films on magnesium and its alloys in aqueous solutions,” vol. 49, pp. 166–175, 2007.
- [186] Z. Koren, “Development of semisolid casting for AZ91 and AM50 magnesium alloys,” vol. 2, pp. 81–87, 2002.
- [187] S. D. Yadav, P. P. Bhingole, G. P. Chaudhari, S. K. Nath, and C. Sommitsch, “Hybrid Processing of AZ91 Magnesium Alloy/Nano-Al₂O₃ Composites,” *Key*

- Eng. Mater.*, vol. 651, p. 783, 2015.
- [188] Y. C. Lin, X. Chen, and G. Chen, “Uniaxial ratcheting and low-cycle fatigue failure behaviors of AZ91D magnesium alloy under cyclic tension deformation,” *J. Alloys Compd.*, vol. 509, no. 24, pp. 6838–6843, 2011.
- [189] A. Zafari, H. M. Ghasemi, and R. Mahmudi, “Tribological behavior of AZ91D magnesium alloy at elevated temperatures,” vol. 293, pp. 33–40, 2012.
- [190] B. R. Sunil *et al.*, “Effect of aluminum content on machining characteristics of AZ31 and AZ91 magnesium alloys during drilling,” *J. Magnes. Alloy.*, vol. 4, no. 1, pp. 15–21, 2016.
- [191] X. J. Wang *et al.*, “Hot deformation behavior of SiCp / AZ91 magnesium matrix composite fabricated by stir casting,” vol. 492, pp. 481–485, 2008.
- [192] Q. Li, C. A. Rottmair, and R. F. Singer, “CNT reinforced light metal composites produced by melt stirring and by high pressure die casting,” *Compos. Sci. Technol.*, vol. 70, no. 16, pp. 2242–2247, 2010.
- [193] S. B. Prabu, L. Karunamoorthy, S. Kathiresan, and B. Mohan, “Influence of stirring speed and stirring time on distribution of particles in cast metal matrix composite,” *J. Mater. Process. Technol.*, 2006.
- [194] Q. I. Q. E, “Evaluation of sliding wear behavior of graphite particle-containing magnesium alloy composites,” 2006.
- [195] A. Rabiei, L. Vendra, and T. Kishi, “Fracture behavior of particle reinforced metal matrix composites,” *Compos. Part A Appl. Sci. Manuf.*, 2008.
- [196] M. J. Shen, X. J. Wang, T. Ying, K. Wu, and W. J. Song, “Characteristics and mechanical properties of magnesium matrix composites reinforced with micron/submicron/nano SiC particles,” *J. Alloys Compd.*, 2016.
- [197] J. Lelito *et al.*, “Effect of SiC reinforcement particles on the grain density in a magnesium-based metal-matrix composite: Modelling and experiment,” *Acta Mater.*, 2012.
- [198] R. . Saravanan and M. . Surappa, “Fabrication and characterisation of pure magnesium-30 vol.% SiCP particle composite,” *Mater. Sci. Eng. A*, vol. 276, no. 1, pp. 108–116, 2000.
- [199] D. J. Towle and C. M. Friend, “Comparison of compressive and tensile properties of magnesium based metal matrix composites,” *Mater. Sci. Technol.*, vol. 9, no. 01, pp. 35–41, 1993.
- [200] B. . Han and D. . Dunand, “Microstructure and mechanical properties of magnesium containing high volume fractions of yttria dispersoids,” *Mater. Sci. Eng. A*, vol. 277, no. 1–2, pp. 297–304, 2000.
- [201] A. Staroselsky and L. Anand, “A constitutive model for hcp materials deforming by slip and twinning: Application to magnesium alloy AZ31B,” *Int. J. Plast.*,

- vol. 19, no. 10, pp. 1843–1864, 2003.
- [202] E. Meza-García *et al.*, “Deformation mechanisms in an AZ31 cast magnesium alloy as investigated by the acoustic emission technique,” *Mater. Sci. Eng. A*, vol. 462, no. 1–2, pp. 297–301, 2007.
- [203] M. R. Barnett, “Twinning and the ductility of magnesium alloys Part I: ‘ Tension ’ twins,” vol. 464, pp. 1–7, 2007.
- [204] M. R. Barnett, “Twinning and the ductility of magnesium alloys Part II . ‘ Contraction ’ twins,” vol. 464, pp. 8–16, 2007.
- [205] D. W. Brown, S. R. Agnew, M. A. M. Bourke, T. M. Holden, S. C. Vogel, and C. N. Tom, “Internal strain and texture evolution during deformation twinning in magnesium,” vol. 399, pp. 1–12, 2005.
- [206] M. R. Barnett, Z. Keshavarz, A. G. Beer, and D. Atwell, “Influence of grain size on the compressive deformation of wrought Mg – 3Al – 1Zn,” vol. 52, pp. 5093–5103, 2004.
- [207] P. Mohazzab, “Archimedes’ Principle Revisited,” *J. Appl. Math. Phys.*, vol. 05, no. 04, pp. 836–843, 2017.
- [208] G. Gertsberg, E. Aghion, A. A. Kaya, and D. Eliezer, “Advanced production process and properties of Die Cast magnesium composites based on AZ91D and SiC,” *J. Mater. Eng. Perform.*, vol. 18, no. 7, pp. 886–892, 2009.
- [209] K. Wu *et al.*, “Microstructure and mechanical properties of SiCp/AZ91 composite deformed through a combination of forging and extrusion process,” *Mater. Des.*, vol. 31, no. 8, pp. 3929–3932, 2010.
- [210] M. Gupta, L. Lu, M. O. Lai, and K. H. Lee, “Microstructure and mechanical properties of elemental and reinforced magnesium synthesized using a fluxless liquid-phase process,” *Mater. Res. Bull.*, vol. 34, no. 8, pp. 1201–1214, 1999.
- [211] A. Luo, “Processing, microstructure, and mechanical behavior of cast magnesium metal matrix composites,” *Metall. Mater. Trans. A*, vol. 26, no. 9, pp. 2445–2455, 1995.
- [212] A. Viswanath, H. Dieringa, K. K. Ajith Kumar, U. T. S. Pillai, and B. C. Pai, “Investigation on mechanical properties and creep behavior of stir cast AZ91-SiCp composites,” *J. Magnes. Alloy.*, vol. 3, no. 1, pp. 16–22, 2015.
- [213] Y. Jingyu and D. D. L. Chung, “Wear of bauxite-particle-reinforced aluminum alloys,” *Wear*, vol. 135, no. 1, pp. 53–65, 1989.
- [214] S. C. Sharma, B. Anand, and M. Krishna, “Evaluation of sliding wear behaviour of feldspar particle-reinforced magnesium alloy composites,” 2000.
- [215] H. Chen and A. T. Alpas, “Sliding wear map for the magnesium alloy Mg-9Al-0 . 9 Zn (AZ91),” vol. 246, pp. 106–116, 2000.

-
- [216] X. Zhang, L. Liao, N. Ma, and H. Wang, "The effect of heat treatment on damping characterization of TiC/AZ91 composites," *Mater. Lett.*, vol. 60, no. 5, pp. 600–604, 2006.
- [217] H. Y. Wang, Q. C. Jiang, X. L. Li, and J. G. Wang, "In situ synthesis of TiC/Mg composites in molten magnesium," *Scr. Mater.*, vol. 48, no. 9, pp. 1349–1354, 2003.
- [218] J. J. Wang, J. H. Guo, and L. Q. Chen, "TiC/AZ91D composites fabricated by in situ reactive infiltration process and its tensile deformation," *Trans. Nonferrous Met. Soc. China*, vol. 16, no. 4, pp. 892–896, 2006.
- [219] K. G. Samuel, "Limitations of Hollomon and Ludwigson stress-strain relations in assessing the strain hardening parameters," *J. Phys. D. Appl. Phys.*, vol. 39, no. 1, pp. 203–212, 2006.
- [220] W. Cao, C. Zhang, T. Fan, and D. Zhang, "In Situ Synthesis and Compressive Deformation Behaviors of TiC Reinforced Magnesium Matrix Composites," *Mater. Trans.*, vol. 49, no. 11, pp. 2686–2691, 2008.
- [221] H. Y. Wang, Q. C. Jiang, Y. Q. Zhao, F. Zhao, B. X. Ma, and Y. Wang, "Fabrication of TiB₂ and TiB₂ – TiC particulates reinforced magnesium matrix composites," vol. 372, pp. 109–114, 2004.
- [222] S. Narayan and A. Rajeshkannan, "Effect of titanium carbide addition on the workability behavior of powder metallurgy aluminum preforms during hot deformation," *Mater. Phys. Mech.*, vol. 32, no. 2, pp. 165–177, 2017.
- [223] N. Jit, A. K. Tyagi, N. Singh, and A. Singh, "Comparison of porosity and density for (A384 . 1) 1-x [(Reinforcement) p] x MMC system using Adaptive Neuro-Fuzzy Inference system," *Adv. Appl. Sci. Res.*, vol. 2, no. 4, pp. 240–250, 2011.
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