

REFERENCES

REFERENCES

- Adams, E., Hubbard, W. M., and Syeles, A. M. (1952). A New Permanent Magnet from Powdered Manganese Bismuthide. *Journal of Applied Physics*. 23(11), 1207-1211.
- Akagi, F. (2019). Magnetic Domain Structures and Techniques in Micromagnetics Simulation. In K. Fujisaki (Ed.), *Magnetic Material for Motor Drive Systems: Fusion Technology of Electromagnetic Fields* (pp. 165-179). Singapore: Springer Singapore.
- Antonov, V. N., and Antropov, V. P. (2020). Low-temperature MnBi alloys: Electronic and magnetic properties, constitution, morphology and fabrication (Review article). *Low Temperature Physics*. 46(1), 1-27.
- Bandaru, R., Sands, T., Weller, D., and Marinero, E. (1999). Magneto-optical properties of chromium-alloyed manganese bismuth thin films. *Journal of Applied Physics*. 86.
- Borsup, J., Eknapakul, T., Thazin Myint, H., Smith, M. F., Yordsri, V., Pinitsoontorn, S., Thanachayanont, C., Zaw Oo, T., and Songsiriritthigul, P. (2022). Formation and magnetic properties of low-temperature phase manganese bismuth prepared by low-temperature liquid phase sintering in vacuum. *Journal of Magnetism and Magnetic Materials*. 544, 168661.
- Cao, J., Huang, Y., Hou, Y. H., Shi, Z. Q., Yan, X. T., Zhong, Z., and Wang, G. P. (2018). Microstructure and magnetic properties of MnBi alloys with high coercivity and significant anisotropy prepared by surfactant assisted ball milling. *Journal of Magnetism and Magnetic Materials*. 473.
- Cao, J., Huang, Y. L., Hou, Y. H., Shi, Z. Q., Yan, X. T., Zhong, Z. C., and Wang, G. P. (2019). Microstructure and magnetic properties of MnBi alloys with high coercivity and significant anisotropy prepared by surfactant assisted ball milling. *Journal of Magnetism and Magnetic Materials*. 473, 505-51

- Cao, J., Huang, Y. L., Hou, Y. H., Zhang, G. Q., Shi, Z. Q., Zhong, Z. C., and Liu, Z. W. (2018). Effects of intergranular phase on the coercivity for MnBi magnets prepared by spark plasma sintering. *AIP Advances*. 8(5), 055132.
- Cao, S., Yue, M., Yang, Y. X., Zhang, D. T., Liu, W. Q., Zhang, J. X., Guo, Z. H., and Li, W. (2011). Magnetic properties and thermal stability of MnBi/NdFeB hybrid bonded magnets. *Journal of Applied Physics*. 109(7), 07A740.
- Chen, T. (1974). Contribution to the equilibrium phase diagram of the Mn–Bi system near MnBi. *Journal of Applied Physics*. 45(5), 2358-2360.
- Chen, Y.-C., Gregori, G., Leineweber, A., Qu, F., Chen, C.-C., Tietze, T., Kronmüller, H., Schütz, G., and Goering, E. (2015). Unique high-temperature performance of highly condensed MnBi permanent magnets. *Scripta Materialia*. 107, 131-135.
- Chen, Y.-C., Sawatzki, S., Ener, S., Sepehri-Amin, H., Leineweber, A., Gregori, G., Qu, F., Muralidhar, S., Ohkubo, T., Hono, K., Gutfleisch, O., Kronmüller, H., Schütz, G., and Goering, E. (2016). On the synthesis and microstructure analysis of high performance MnBi. *AIP Advances*. 6(12), 125301.
- Corbin, S., and Mclsaac, J. (2003). Differential scanning calorimetry of the stages of transient liquid phase sintering. *Materials Science and Engineering A-structural Materials Properties Microstructure and Processing - MATER SCI ENG A-STRUCT MATER*. 346, 132-140.
- Cui, J., Choi, J. P., Li, G., Polikarpov, E., Darsell, J., Overman, N., Olszta, M., Schreiber, D., Bowden, M., Droubay, T., Kramer, M. J., Zarkevich, N. A., Wang, L. L., Johnson, D. D., Marinescu, M., Takeuchi, I., Huang, Q. Z., Wu, H., Reeve, H., Vuong, N. V., and Liu, J. P. (2014). Thermal stability of MnBi magnetic materials. *Journal of Physics: Condensed Matter*. 26(6), 064212.
- Cui, J., Kramer, M., Zhou, L., Liu, F., Gabay, A., Hadjipanayis, G., Balasubramanian, B., and Sellmyer, D. (2018). Current progress and future challenges in rare-earth-free permanent magnets. *Acta Materialia*. 158, 118-137.
- Energy, U. S. D. o. (2010). *U.S. Department of Energy Critical Materials Strategy*. United States: Department of Energy.

- Gupta, R. K., Anil Kumar, V., and Khanra, G. P. (2018). Reactive and liquid-phase sintering techniques. In R. Mitra (Ed.), *Intermetallic Matrix Composites* (pp. 303-318): Woodhead Publishing.
- Huang, Y. L., Shi, Z. Q., Hou, Y. H., and Cao, J. (2019). Microstructure, improved magnetic properties, and recoil loops characteristics for MnBi alloys. *Journal of Magnetism and Magnetic Materials*. 485, 157-164.
- Jacobson, J., and Kim, A. (1987). Oxidation behavior of Nd-Fe-B magnets. *Journal of Applied Physics*. 61(8), 3763-3765.
- Jain, S. D. (2010). *Engineering Physics: Universities Press*.
- Janotová, I., Švec, P., Matko, I., Janičkovič, D., and Sr., P. Š. (2018). Evolution and degradation of magnetic MnBi phase. *AIP Conference Proceedings*. 1996(1), 020021.
- Jensen, B. A., Tang, W., Liu, X., Nolte, A. I., Ouyang, G., Dennis, K. W., and Cui, J. (2019). Optimizing composition in MnBi permanent magnet alloys. *Acta Materialia*. 181, 595-602.
- Kang, S.-J. (2005). *Sintering, Densification, Grain Growth and Microstructure*. USA: Elsevier Butterworth-Heinemann.
- Kharel, P., Shah, V. R., Li, X. Z., Zhang, W. Y., Skomski, R., Shield, J. E., and Sellmyer, D. J. (2013). Structural and magnetic properties of Pr-alloyed MnBi nanostructures. *Journal of Physics D: Applied Physics*. 46(9), 095003.
- Kim, S., Moon, H., Jung, H., Kim, S.-M., Lee, H.-S., Choi-Yim, H., and Lee, W. (2017). Magnetic properties of large-scaled MnBi bulk magnets. *Journal of Alloys and Compounds*. 708, 1245-1249.
- Kirkemide, A., Shen, J., Gong, M., Cui, J., and Ren, S. (2015). Metal-Redox Synthesis of MnBi Hard Magnetic Nanoparticles. *Chemistry of Materials*. 27(13), 4677-4681.
- Kishimoto, M., and Wakai, K. (1977). Effect of Grinding on the Coercivity of MnBi Particles. *Japanese Journal of Applied Physics*. 16(3), 459-463.
- Klysubun, W. (2006). *X-ray absorption spectroscopy at Siam Photon Laboratory*. Nakhon Ratchasima: Synchrotron Light Research Institute.

- Ko, K. Y., Choi, S. J., Yoon, S. K., and Kwon, Y. S. (2007). MnBi magnets fabricated through spark plasma-sintering process. *Journal of Magnetism and Magnetic Materials*. 310(2, Part 3), e887-e889.
- Kramer, M. J., McCallum, R. W., Anderson, I. A., and Constantinides, S. (2012). Prospects for Non-Rare Earth Permanent Magnets for Traction Motors and Generators. *JOM Journal of the Minerals Metals and Materials Society*. 64(7), 752-763.
- Li, B., Ma, Y., Shao, B., Li, C., Chen, D., Sun, J., Zheng, Q., and Yin, X. (2018). Preparation and magnetic properties of anisotropic MnBi powders. *Physica B: Condensed Matter*. 530, 322-326.
- Li, X., Pan, D., Zhen, X., Lu, W., and Batalu, D. (2019). Microstructure and Magnetic Properties of Mn₅₅Bi₄₅ Powders Obtained by Different Ball Milling Processes. *Metals*. 9, 441.
- Liu, S., Wang, J., and Dong, F. (2018). A new bottom-up synthesis of MnBi particles with high magnetic performance. *Chemical Physics Letters*. 691, 325-329.
- Ly, V., Wu, X., Smillie, L., Shoji, T., Kato, A., Manabe, A., and Suzuki, K. (2014). Low-temperature phase MnBi compound: A potential candidate for rare-earth free permanent magnets. *Journal of Alloys and Compounds*. 615, S285-S290.
- Mehrer, H. (2007.). *Diffusion in solids : fundamentals, methods, materials, diffusion-controlled processes*. Berlin, New York : Springer.
- Mican, S., Hirian, R., Isnard, O., Chicinaş, I., and Pop, V. (2015). Effect of Milling Conditions on the Microstructure and Interphase Exchange Coupling of Nd₂Fe₁₄B/ α -Fe Nanocomposites. *Physics Procedia*. 75, 1314-1323.
- Mohapatra, J., and Liu, J. P. (2018). *Handbook of Rare-Earth-Free Permanent Magnets: The Past and Future* (Vol. 27). Brück.: Elsevier.
- Nguyen, P.-K., Jin, S., and Berkowitz, A. E. (2013). Unexpected Magnetic Domain Behavior in LTP-MnBi. *IEEE Transactions on Magnetics*. 49(7), 3387-3390.
- Nguyen, V., Poudyal, N., Liu, X., Liu, J., Kramer, M., and Cui, J. (2014). High-Performance MnBi Alloy Prepared Using Profiled Heat Treatment. *Magnetics, IEEE Transactions on*. 50, 1-6.

- Nguyen, V. V., Poudyal, N., Liu, X. B., Liu, J. P., Sun, K., Kramer, M. J., and Cui, J. (2014). Novel processing of high-performance MnBi magnets. *Materials Research Express*. 1(3), 036108.
- Nieminen, H.-E., Miikkulainen, V., Settapani, D., Simonelli, L., Hönicke, P., Zech, C., Kayser, Y., Beckhoff, B., Honkanen, A.-P., Heikkilä, M. J., Mizohata, K., Meinander, K., Ylivaara, O. M. E., Huotari, S., and Ritala, M. (2019). Intercalation of Lithium Ions from Gaseous Precursors into β -MnO₂ Thin Films Deposited by Atomic Layer Deposition. *The Journal of Physical Chemistry C*. 123(25), 15802-15814.
- Park, J., Hong, Y.-K., Lee, J., Lee, W., Kim, S.-G., and Choi, C.-J. (2014). Electronic Structure and Maximum Energy Product of MnBi. *Metals*. 4(3), 455-464.
- Patel, K., Zhang, J., and Ren, S. (2018). Rare-earth-free high energy product manganese-based magnetic materials. *Nanoscale*. 10(25), 11701-11718.
- Persson, K. (2016). *Materials Data on MnBi (SG:194) by Materials Project*. Retrieved from <https://www.osti.gov/dataexplorer/biblio/dataset/1274398>.
- Poudyal, N., Liu, X., Wang, W., Nguyen, V. V., Ma, Y., Gandha, K., Elkins, K., Liu, J. P., Sun, K., Kramer, M. J., and Cui, J. (2016). Processing of MnBi bulk magnets with enhanced energy product. *AIP Advances*. 6(5), 056004.
- Prozorov, R., and Kogan, V. G. (2018). Effective Demagnetizing Factors of Diamagnetic Samples of Various Shapes. *Physical Review Applied*. 10(1), 014030.
- Rama Rao, N. V., Gabay, A. M., and Hadjipanayis, G. C. (2013). Anisotropic fully dense MnBi permanent magnet with high energy product and high coercivity at elevated temperatures. *Journal of Physics D: Applied Physics*. 46(6), 062001.
- Rama Rao, N. V., Gabay, A. M., Hu, X., and Hadjipanayis, G. C. (2014). Fabrication of anisotropic MnBi nanoparticles by mechanochemical process. *Journal of Alloys and Compounds*. 586, 349-352.
- Ravel, B., and Newville, M. (2005). ATHENA, ARTEMIS, HEPHAESTUS: data analysis for X-ray absorption spectroscopy using IFEFFIT. *Journal of Synchrotron Radiation*. 12(4), 537-541.
- Rehr, J. J., Kas, J. J., Vila, F. D., Prange, M. P., and Jorissen, K. (2010). Parameter-free calculations of X-ray spectra with FEFF9. *Physical Chemistry Chemical Physics*. 12(21), 5503-5513.

- Roberts, B. W. (1956). Neutron Diffraction Study of the Structures and Magnetic Properties of Manganese Bismuthide *Physical Review*. 104(3), 5.
- Sarkar, A., and Basu Mallick, A. (2020). Synthesizing the Hard Magnetic Low-Temperature Phase of MnBi Alloy: Challenges and Prospects. *JOM Journal of the Minerals Metals and Materials Society*. 72(8), 2812-2825.
- Schneider, C. A., Rasband, W. S., and Eliceiri, K. W. (2012). NIH Image to ImageJ: 25 years of image analysis. *Nature methods*. 9(7), 671-675.
- Si, P. Z., Yang, Y., Yao, L. L., Qian, H. D., Ge, H. L., Park, J., Chung, K. C., and Choi, C. J. (2019). Magnetic-field-enhanced reactive synthesis of MnBi from Mn nanoparticles. *Journal of Magnetism and Magnetic Materials*. 476, 243-247.
- Sun, J., Li, C., Huang, Q., Guo-Lei, L., Han, G. B., Yu, S., and Kang, S.-s. (2016). A facile way to synthesize rare-earth-free MnBi magnetic nanoparticles. *RSC Adv*. 6.
- Sun, M. Y., Xu, X. W., Liang, X. A., Sun, X. W., and Zheng, Y. J. (2016). Effect of oxidation on perpendicular magnetic behavior of MnBi thin films. *Journal of Alloys and Compounds*. 672, 59-63.
- Truong, N., and Nguyen, V. (2015). Preparation and Magnetic Properties of MnBi Alloy and its Hybridization with NdFeB. *Journal of Magnetism*. 20, 336-341.
- Truong, N., and Vuong, N. (2015). Preparation and Magnetic Properties of MnBi Alloy and its Hybridization with NdFeB. *Journal of Magnetism*. 20, 336-341.
- Tu, C., and Stutius, W. (1974). The phase transformation and physical properties of the MnBi and Mn_{1.08}Bi compounds. *IEEE Transactions on Magnetism*. 10(3), 581-586.
- Van Nguyen, V., and Nguyen, T. X. (2017). An Approach for Preparing High-Performance MnBi Alloys and Magnets. *Journal of Electronic Materials*. 46(6), 3333-3340.
- Villanueva, M., Navío, C., Céspedes, E., Mompeán, F., García-Hernández, M., Camarero, J., and Bollero, A. (2019). MnBi thin films for high temperature permanent magnet applications. *AIP Advances*. 9(3), 035325.
- Vuong, N. V. (2019). MnBi Magnetic Material: A Critical Review. *Communications in Physics*. 29(4).

- Xie, W., Polikarpov, E., Choi, J.-P., Bowden, M. E., Sun, K., and Cui, J. (2016). Effect of ball milling and heat treatment process on MnBi powders magnetic properties. *Journal of Alloys and Compounds*. 680, 1-5.
- Yang, J. B., Yelon, W. B., James, W. J., Cai, Q., Roy, S., and Ali, N. (2002). Structure and magnetic properties of the MnBi low temperature phase. *Journal of Applied Physics*. 91(10), 7866-7868.
- Yang, Y. B., Chen, X. G., Guo, S., Yan, A. R., Huang, Q. Z., Wu, M. M., Chen, D. F., Yang, Y. C., and Yang, J. B. (2013). Temperature dependences of structure and coercivity for melt-spun MnBi compound. *Journal of Magnetism and Magnetic Materials*. 330, 106-110.
- Yang, Y. B., Chen, X. G., Wu, R., Wei, J. Z., Ma, X. B., Han, J. Z., Du, H. L., Liu, S. Q., Wang, C. S., Yang, Y. C., Zhang, Y., and Yang, J. B. (2012). Preparation and magnetic properties of MnBi. *Journal of Applied Physics*. 111(7), 07E312.
- Yang, Y. B., Wei, J. Z., Peng, X. L., Xia, Y. H., Chen, X. G., Wu, R., Du, H. L., Han, J. Z., Wang, C. S., Yang, Y. C., and Yang, J. B. (2014). Magnetic properties of the anisotropic MnBi/Sm₂Fe₁₇N_x hybrid magnet. *Journal of Applied Physics*. 115(17), 17A721.
- Yoshida, H., Shima, T., Takahashi, T., and Fujimori, H. (1999). Preparation of Highly Pure MnBi Intermetallic Compounds by Arc-Melting. *Materials Transactions, JIM*. 40(5), 455-458.
- Yoshida, S., Okumura, T., Kita, H., Takahashi, J., and Ushioda, K. (2014). High Temperature Tensile Properties and Its Mechanism in Low-Carbon Nb-Bearing Steels. *Materials Transactions*. 55(6), 899-906.
- Zhang, D. T., Cao, S., Yue, M., Liu, W. Q., Zhang, J. X., and Qiang, Y. (2011). Structural and magnetic properties of bulk MnBi permanent magnets. *Journal of Applied Physics*. 109(7), 07A722.
- Zhang, D. T., Geng, W. T., Yue, M., Liu, W. Q., Lu, Q. M., Zhang, J. X., Guo, Z. H., Li, W., Sundararajan, J. A., and Qiang, Y. (2014). Magnetic properties and thermal stability of MnBi/SmFeN hybrid bonded magnets. *Journal of Applied Physics*. 115(17), 17A746.

Zhang, Y., Han, J., Liu, S., Tian, H., Zhao, H., Du, H., Yang, Y., Fang, Y., Li, W., and Yang, J. (2017). Structural modification and ultra-high coercivity of nanostructural anisotropic MnBi/Bi films. *Acta Materialia*. 128.