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Research Interests

Mechanisms and applications of heat treatments and sintering technology (especially for Spark Plasma Sintering SPS technology), powder metallurgy technology and melt-spinning technology; Phase stability and thermal stability of nanomaterials; Nanostructured rare-earth metals and alloys, especially in Rare earth permanent magnetic material (SmFeN, NdFeB and SmCo magnets).

Academic Experience

2012~Now, Research Associate, Department of Energy & Environment, Graduate School at Shenzhen, Tsinghua University

2008~2012, PhD of Science, Department of Materials Science, Beijing University of Technology

2001~2008, Bachelor and Master of Science, Department of Materials Science, Hebei University of Technology

Award

Cultivation Foundation Award for Excellent PhD Thesis at Beijing University of Technology (2010)

Excellent PhD Thesis Award at Beijing University of Technology (2012)

SCI-Journal Papers:

- [1] Sun J. B., Zhang Z. X., Cui C. X., Yang W., Guo P., Han D., Wang B. L. Effect of rapid quenching speeds on phase structure and magnetic properties of melt-spun Sm(Co,Fe,Cu,Zr)_{7.5} ribbons. *Journal of Alloys and Compounds*, 2009, 476, 575-578.
- [2] Sun J. B., Zhang Z. X., Cui C. X., Yang W., Li L., Han D., Yang L. G., Li L. J. Sm₁₂Co₅₉Cu₆Fe₂₀Zr₃ sintered magnets made from as-cast alloy and melt-spun ribbons. *Journal of Alloys and Compounds*, 2009, 486, 819-823.
- [3] Sun J. B., Zhang Z. X., Cui C. X., Yang W., Han D., Wang B. L. Effect of Fe on the structure and magnetic properties of Sm-Co-Cu-Fe-Zr melt-spun ribbons. *Materials Science and Engineering B*, 2009, 157, 72-76.
- [4] Sun J. B., Javed A., Zhang Z. X., Cui C. X., Zhang M. X., Han R. P. Effect of B addition on the microstructure and magnetic properties of melt-spun Sm₁₂Co_{60-x}Fe₁₉Cu₆Zr₃B_x (0≤x≤3) ribbons. *Materials Science and Engineering B*, 2010, 167, 102-106.
- [5] Zhang Z. X., Song X. Y., Qiao Y. K., Xu W. W., Zhang J. X., Seyring M., Rettenmayr M. A nanocrystalline Sm-Co compound for high-temperature permanent magnets. *Nanoscale*, 2013, 5, 2279-2284.

- [6] Zhang Z. X., Song X. Y., Xu W. W. Phase stability, phase transformation and effects on magnetic performance of nanocrystalline SmCo₇ alloy. *Acta Materialia*, 2011, 59, 1808–1817.
- [7] Zhang Z. X., Song X. Y., Xu W. W., Seyring M., Rettenmayr M. Crystal structure and magnetic performance of single-phase nanocrystalline SmCo₇ alloy. *Scripta Materialia*, 2010, 62, 594-597.
- [8] Zhang Z. X., Song X. Y., Xu W. W., Li D. P., Liu X. M. Crystal structure and magnetic performance of nanocrystalline SmCo_{9.8} alloy. *Journal of Applied Physics*, 2011, 110, 124318-4.
- [9] Zhang Z. X., Song X. Y., Xu W. W., Lu N. D. Phase constitution, evolution and correlation with magnetic performance in nominal SmCo_{9.8} alloy. *Journal of Alloys and Compounds*, 2009, 476, 575-578.
- [10] Xu W. W., Song X. Y., Zhang Z. X. Thermodynamic study on metastable phase: from polycrystalline to nanocrystalline system, *Applied Physics Letters*, 2010, 97, 181911-3.
- [11] Xu W. W., Song X. Y., Zhang Z. X. Multiphase equilibrium, phase stability and phase transformation in nanocrystalline alloy systems. *Nano*, 2012, 7, 1250012-10.
- [12] Xu W. W., Song X. Y., Zhang Z. X. Liang H. N. Experimental and modeling studies on phase stability of nanocrystalline magnetic Sm₂Co₇. *Materials Science and Engineering B*, 2013, 178, 971-976.
- [13] Song X. Y., Lu N. D., Xu W. W., Zhang Z. X., Zhang J. X. Phase transformation in nanocrystalline Sm₂Co₁₇ permanent magnet material. *Journal of Applied Crystallography*, 2009, 42, 691-696.

Inventions:

- [1] 宋晓艳, 张哲旭, 李定朋. 一种超高矫顽力低 Co 型 Sm-Co 纳米晶合金的制备方法, 专利号: ZL201110053761. X, 已授权.
- [2] 宋晓艳, 张哲旭. 一种无掺杂元素的单相 SmCo₇ 纳米晶合金块体材料的制备方法, 公开号: CN101962722A, 已公开.
- [3] 宋晓艳, 李定朋, 张哲旭. 一种富 Sm 单相 Sm₅Co₂ 纳米晶合金块体材料的制备方法, 专利号: ZL201110145590. 3, 已授权.
- [4] 宋晓艳, 贺将韬, 徐文武, 张哲旭. 一种亚稳相 LiC₆ 合金的制备方法, 专利号: ZL201110280455. X, 已授权.