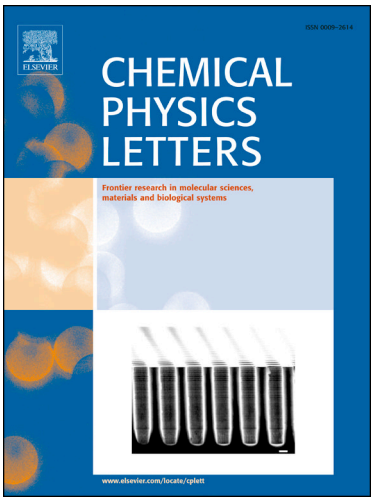

Research paper

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Shoufa Liu, Jinpeng Wang, Feng Dong

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A New Bottom-up Synthesis of MnBi Particles with High Magnetic Performance

Shoufa Liu[a]*, Jinpeng Wang[b], Feng Dong[c]

[a]School of Mechanical Engineering, Xijing University, Xi'an, China

[b]School of Mechanical & Electrical Engineering, Northwestern Polytechnical University, Xi'an, China

[c]Xi'an Thermal Power Research Institute, Xi'an, China

Abstract:

Mn and Bi nanoparticles were synthesized by a wet chemistry reduction process. The as-synthesized Mn and Bi nanoparticles were mixed in hexane with the molar ratio of 1 to 1, and annealed at 250 ^{o}C in an inert gas environment. In four parallel experiments, the annealing time was controlled to be 2, 4, 6, and 8 hours. The impacts of annealing time on product morphology, crystallization, and magnetic properties were investigated. The results showed that within 6 hours annealing, an increased annealing time resulted in more sintering among the particles in the products, enhanced crystallization, and improved magnetic properties. When the annealing time exceeded 6 hours, further annealing did not bring much difference in morphology, crystallization, and magnetic properties, indicating a thermally stable state of the product.

Keywords: Nanoparticles; Magnetic materials; Nanocrystalline material; X-ray techniques; Manganese Bismuth.

*Corresponding author: shoufaliu02@gmail.com (S. Liu).