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FeCo Nanoparticles by Salt-Matrix Annealing[1] NARAYAN POUDYAL, GIRIJA S. CHAUBEY, CHUAN-BING RONG, J. PING LIU, Department of Physics, University of Texas at Arlington — Preparation of monodisperse FeCo nanoparticles remains a challenge due to poor chemical stability of the nanoparticles during heat treatments. We report a novel route of preparation of monodisperse FeCo nanoparticles with controllable particle size and size distribution. $CoFe_2O_4$ nanoparticles were first prepared by chemical solution method via reduction of iron acetylacetonate and cobalt acetylacetonate. The as-synthesized $CoFe_2O_4$ nanoparticles were then mixed with NaCl powder particles and the mixtures were annealed in forming gas to form FeCo nanoparticles. Structural characterization showed that the FeCo nanoparticles obtained by salt-matrix annealing have been transformed to body-centered cubic (bcc) structure without sintering and agglomeration. The particle size can be well controlled by adjusting the synthetic parameters for $CoFe_2O_4$ nanoparticles. It is also found that the recovered bcc FeCo nanoparticles are stable under ambient condition. The magnetization of the FeCo nanoparticles is found to be size dependent.

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