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**Novel Approaches for the  
Synthesis of FeCo Nanoparticles<sup>1</sup>**

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— FeCo alloys are an important soft magnetic material because of their  
unique magnetic properties including large permeability and very high  
saturation magnetization. FeCo nanoparticles have attracted great in-  
terests recently because of their potential applications as building blocks  
of advanced nanomagnets and applications in biomedical technologies.  
However, preparation of monodisperse FeCo nanoparticles remains a  
challenge due to the poor chemical stability of the nanoparticles. In this  
poster, we report two novel routes of preparation of monodisperse FeCo  
nanoparticles with controllable particle size and size distribution. First  
method involves the synthesis of FeCo nanoparticles by high tempera-  
ture solution phase method. In our second approach, FeCo nanoparticles  
were prepared by salt matrix annealing of the  $\text{CoFe}_2\text{O}_4$  nanoparticles in  
forming gas (7%  $\text{H}_2$  + 93% Ar). The formation of the alloy nanoparti-  
cles were confirmed by X-ray diffraction (XRD) and transmission elec-  
tron microscopy (TEM). It is also found that the bcc FeCo nanoparticles  
are stable under ambient condition. The magnetization of the FeCo  
nanoparticles is found to be size dependent.

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