Supporting Information

Controllable Nd$_2$Fe$_{14}$B/α-Fe Nanocomposites: Chemical Synthesis and Magnetic Properties

Lianqing Yu$^{a, b}$, Ce Yang$^a$, and Yanglong Hou$^{a, *}$

$^a$Department of Materials Science and Engineering, College of Engineering, Peking University, Beijing 100871, China.

$^b$College of Science, China University of Petroleum, Qingdao 266580, China

Figure S1. The size distribution histograms of 5 nm α-FeNPs

Figure S2. SEM images of Nd$_2$Fe$_{14}$B/α-Fe nanocomposite powder with total Nd/Fe ratio of 2.6/10. EDS analysis shows the molar ratio of Nd to Fe=1.42:10
Figure S3 $\alpha$-Fe NPs with size of 10nm prepared by Fe(CO)$_5$ a) SEM, b) size distribution, c) HRTEM of the corresponding nanocomposite.
Figure S4. TEM images of Nd-Fe-B-oxide/\(\alpha\)-Fe precursor with total Nd/Fe ratio of 1.3/10.

Figure S5. XRD patterns of Nd\(_2\)Fe\(_{14}\)B/\(\alpha\)-Fe nanocomposites synthesized from Nd-Fe-B-oxide/\(\alpha\)-Fe precursor with total Nd/Fe ratio of 1.3/10. The nanocomposites can be indexed as a tetragonal structure Nd\(_2\)Fe\(_{14}\)B phase (JCPDS No. 36-1296) and \(\alpha\)-Fe phase (JCPDS No. 06-0696).
Figure S6. XRD patterns of Nd$_2$Fe$_{14}$B/α-Fe nanocomposites synthesized from Nd-Fe-B-oxide/α-Fe precursor with total Nd/Fe ratio of 2.6/10 under reduction & diffusion process of different temperature and time. The nanocomposites can be indexed as a tetragonal structure Nd$_2$Fe$_{14}$B phase (JCPDS No. 36-1296) and α-Fe phase (JCPDS No. 06-0696).