The morphology of the as-prepared nannowire was characterized by SEM and TEM. The nanowires were imaged using a JEOL JEM-100CX□TEM with an accelerating voltage 100KV and JSM-6301F SEM (Japan) operated at an accelerating voltage of 5kV.

Elemental analyses of the as-synthesized nanowires were performed at energy-dispersive X-ray spectroscope (EDX) equipped onto SEM. Quantitative EDX analysis showed the mole ration of Fe:O was in the range of 1:1.62 –1:1.67 and carbon (3.81-4.44 at. %) was also found, which could come from surface adsorption of organic compound. Another source of the oxygen and carbon signals could be P123 or EG that was not completely removed by the cleaning step.

For X-ray powder diffraction patterns of the wires assemblies were collected on a Japan DMAX-RB diffractometer under Cu Kα radiation (λ=1.5406 Å).

The structure of the nanowires was characterized using HRTEM and Selected area electron diffraction(SAED) on a JEOL JEM-2010 TEM(200KV). Dots diffractions with d values of 4.83, 2.96, 2.53, 2.08, 1.79, 1.63, and 1.48 Å can be identified as (111), (220), (311), (400), (422), (511), and (422) peaks from the cubic structure, respectively. HRTEM studies indicate the long direction is parallel to the (31ī) plane in Fe_3O_4 and most of the nanowires grow parallel to (31ī) plane.

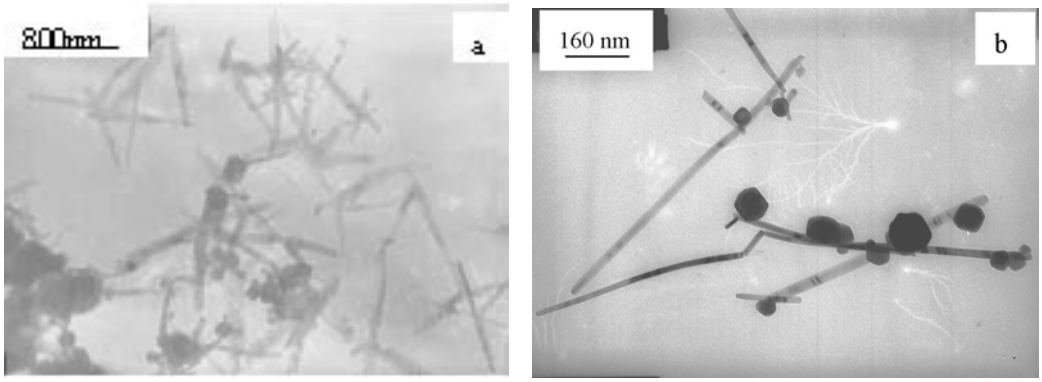

Fig. S1 TEM images of the magnetic nanowires prepared in different ratio of P123 and EG: (a) 0; (b) 20;wt %.

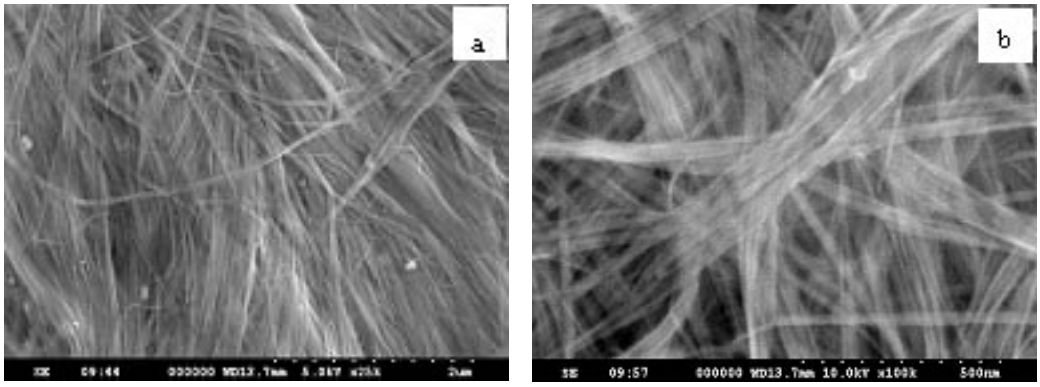

Fig. S2 SEM images of the magnetic nanowires prepared at P123/EG (0.50 wt%) in different magnifications.

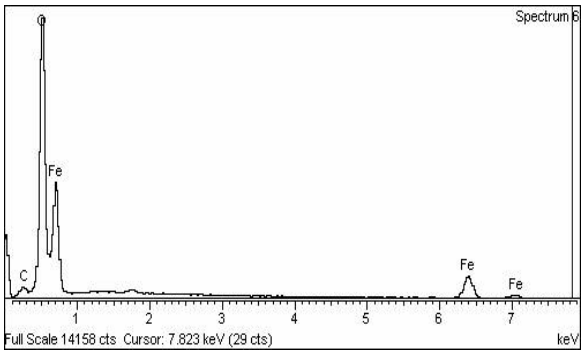

Fig. S3 Energy-dispersive X-ray spectro- scopy (EDX) of Fe_3O_4 nanowires.

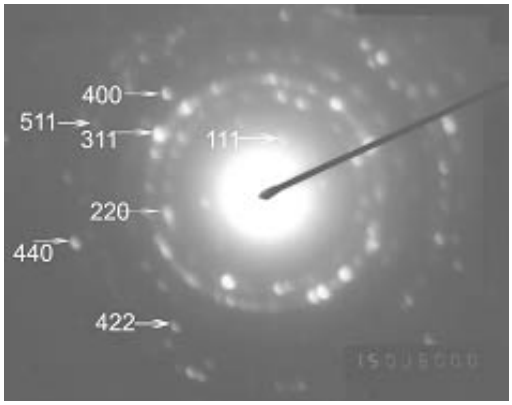

Fig. S4 Electron diffraction pattern of a Fe_3O_4 nanowire