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Synthesis of monodispersed fcc and fct FePt/FePd nanoparticles by microwave irradiation

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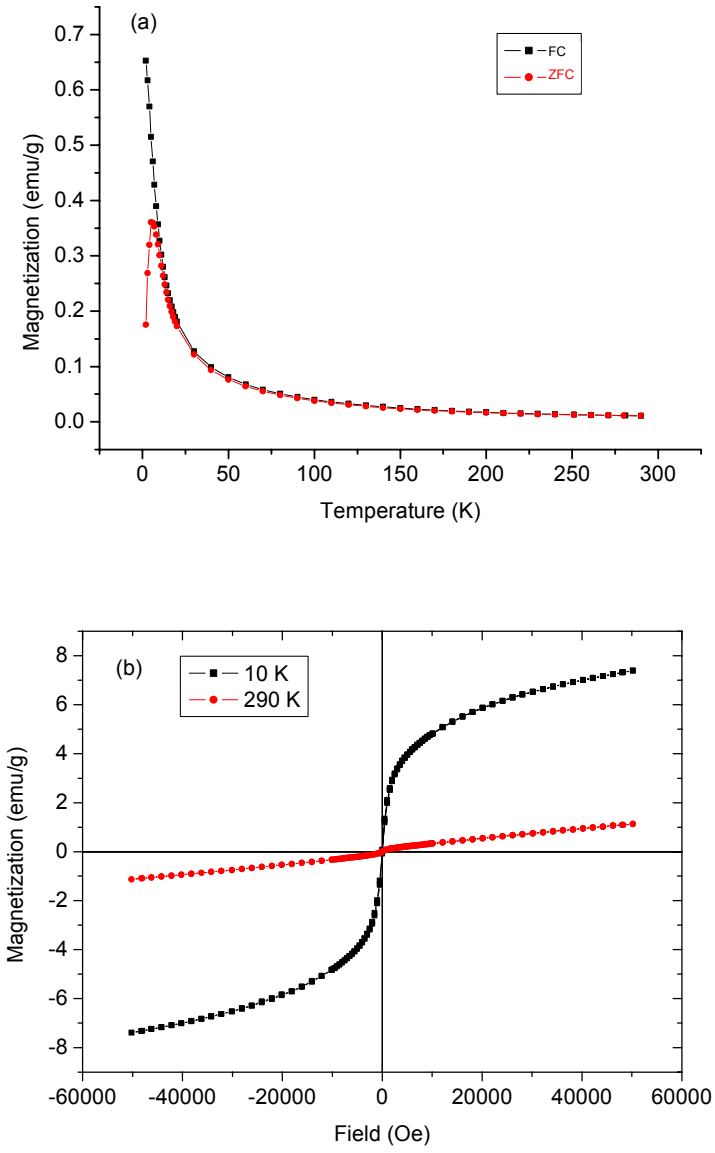

Fig. S1 (a) ZFC and FC magnetisation curves as function of temperature from 5 to 300 K at a field 100 Oe; (b) Magnetic hysteresis loops measured at 10 and 290 K of as-prepared fcc FePt particles sample 2 of Table 1.

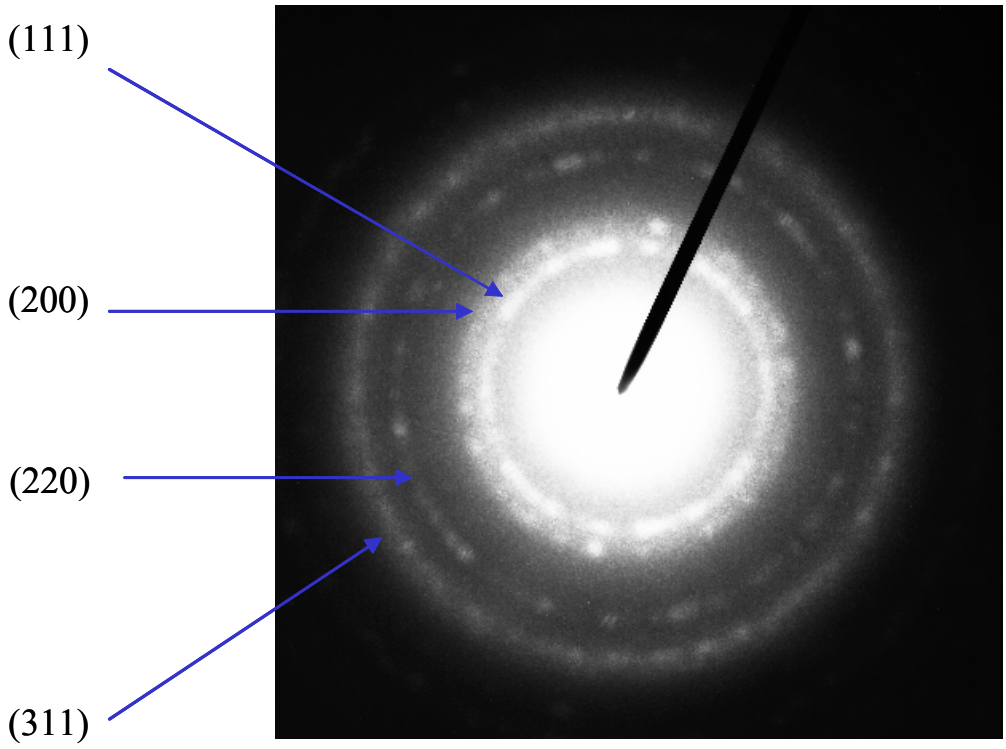

Fig. S2 SAED pattern of sample 1 showing broad diffraction rings derived from ~300 ~random orientated nanoparticles showing (111), (200), (220) and (311) reflections.

Miller indices	SAED d spacing (nm)	XRD d spacing (nm)
(111)	0.23-0.21	0.224
(200)	0.20-0.19	0.194
(220)	0.14-0.13	0.137
(311)	0.12-0.11	0.117

Table S1 SAED and XRD d-spacings of 2.6 nm particles (sample 1 of Table 1).

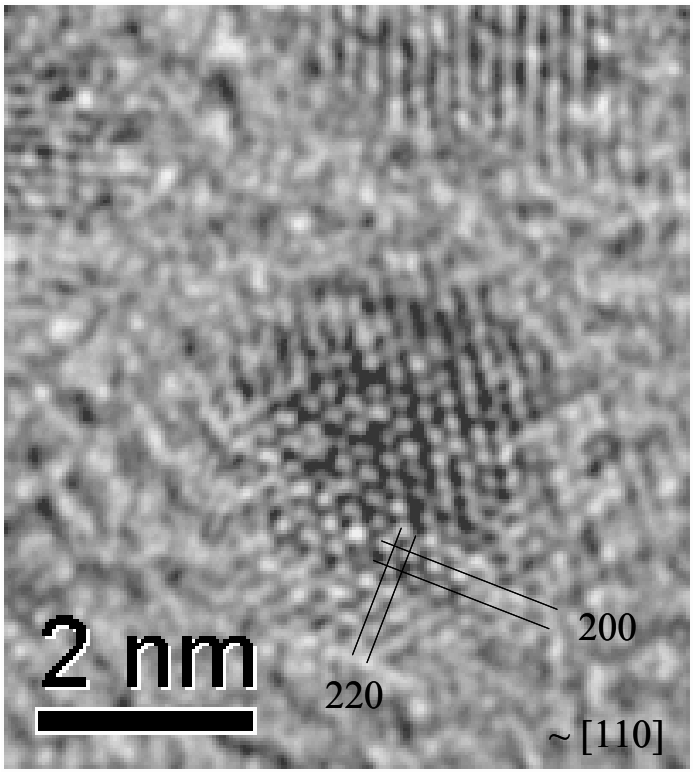

Fig. S3 The HRTEM images orientated near (110) zone shows single crystals with lattice fringes consistent with the (200) and (220) d-spacing of ~1.9 Å and ~1.3 Å respectively.

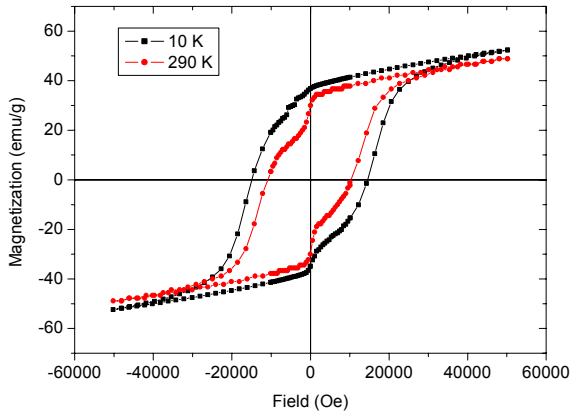

Fig. S4 Hysteresis loops of post-annealed sample showing high coercivity ~ 10 kOe (290 K) and ~ 14 kOe (10 K). Sample was synthesized in a closed system in the presence of oleic acid and oleyl amine as surfactants in octyl ether at 280 ºC and annealed to give fct FePt nanoparticles at 688 K in an experiment equivalent to that of Fig.5. The sample shows a high susceptibility close to H=0 at 290 K. Similar features have been observed in the literature and ascribed to 2-phase magnetic behaviour related either to particle size dependence of the fcc→fct transition or to chemical composition fluctuations.[4d,16]

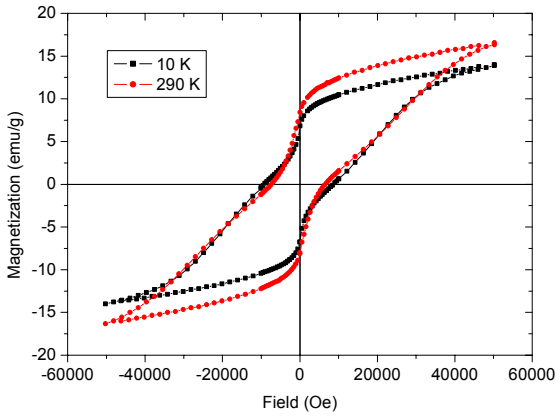

Fig. S5 Hysteresis loops (10 and 290 K) of as-prepared sample containing mixture of fcc and fct FePt particles.