Electronic Supplementary Material (ESI) for Green Chemistry.

Direct chemical synthesis of well dispersed $L1_0$-FePt Nanoparticles with tunable size and coercivity

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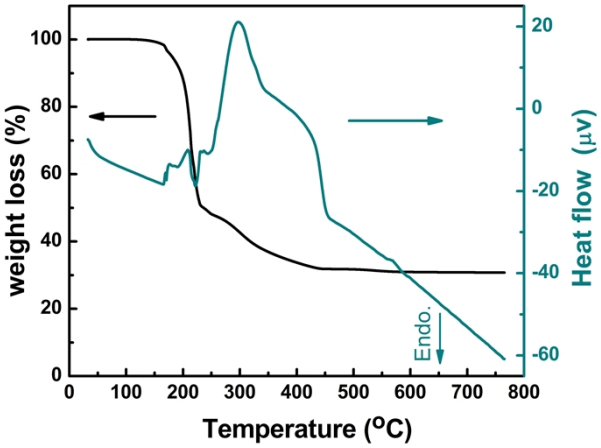


Figure S1a. TG/DTA curves illustrated the decomposition of the precursor.

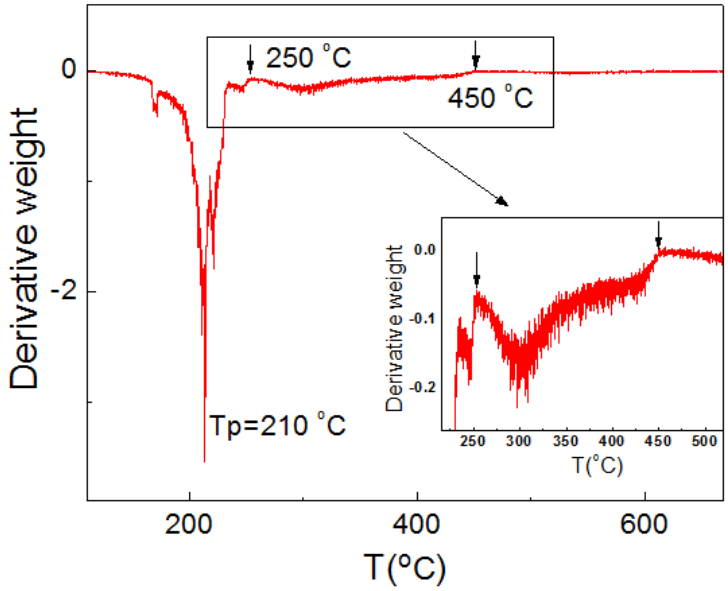


Figure S1b The derivative of weight loss.

DTA and TG were measured to know the decomposition process of the mixture of precursors ($Fe(acac)_3$ and $Pt(acac)_2$) in an alumina crucible with a heating rate of 5 °C/min under Ar flow. As shown in Figure S1, the precursor has two main weight loss stages in the temperature range of 200-500 °C. The first weight loss occurs at around 200 °C, and the very sharp and strong peak at 210°C as clearly shown on the derivative curve of weight loss in Figure S2b is attributed to the decomposition of the precursors. The strong and obvious endothermic peak appeared at 300 °C has a little bit delay compared with that of weight loss. The second weight loss occurs at 250 °C and finished at 450 °C as clearly shown in Figure S2b, which may be attributed to the loss of carbon. Since the decomposition of metal precursors of $Fe(acac)_3$ and $Pt(acac)_2$ gives out Fe and Pt metal atoms, carbon C and H_2O. At temperature around 250 °C,

the reaction of $C+H_2O = H_2+CO$ will happen, which leads to the weight loss and an endothermic kink. At a temperature around 450 °C, this reaction ends, and therefore weight loss stops and endothermic peak disappears. There is another possibility that the change of weight loss between 250 °C and 450 °C may due to a phase transition from fcc structure to $L1_0$ structure. At higher temperatures no weight loss and endothermic peak is observed.

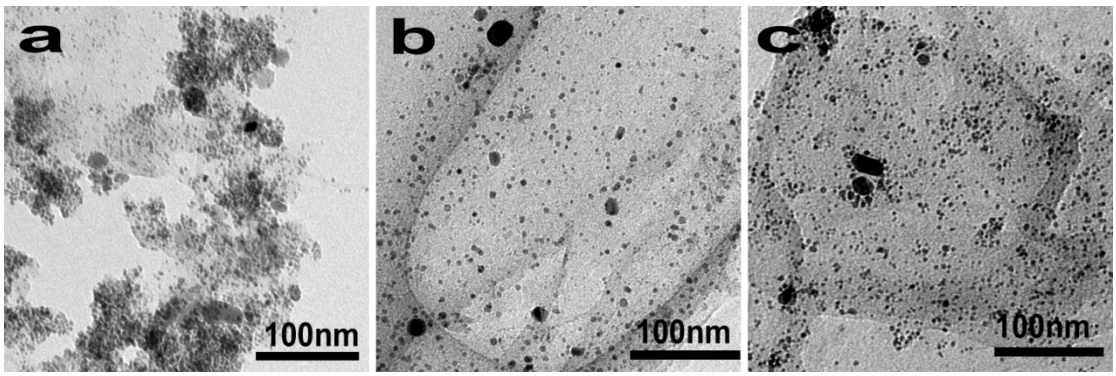
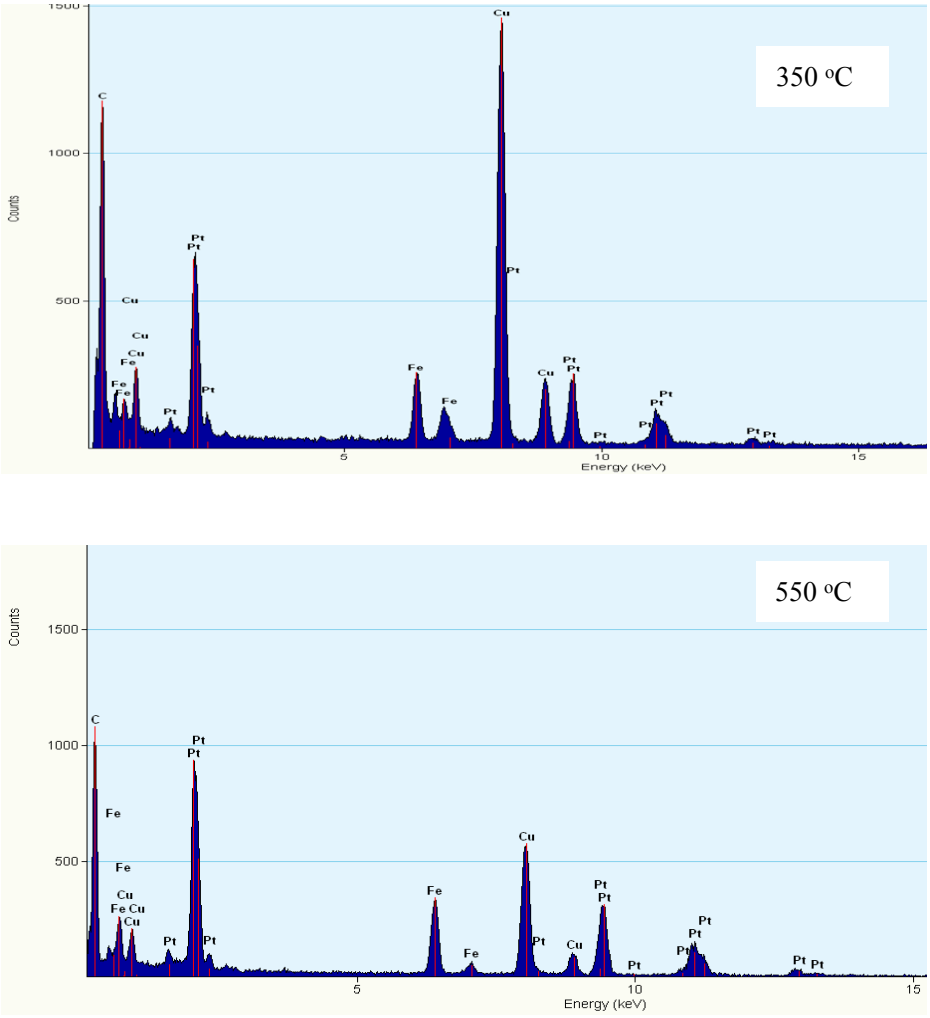


Figure S2 TEM images of the FePt NPs obtained at 300 °C (a), 400 °C (b), 450 °C (c).



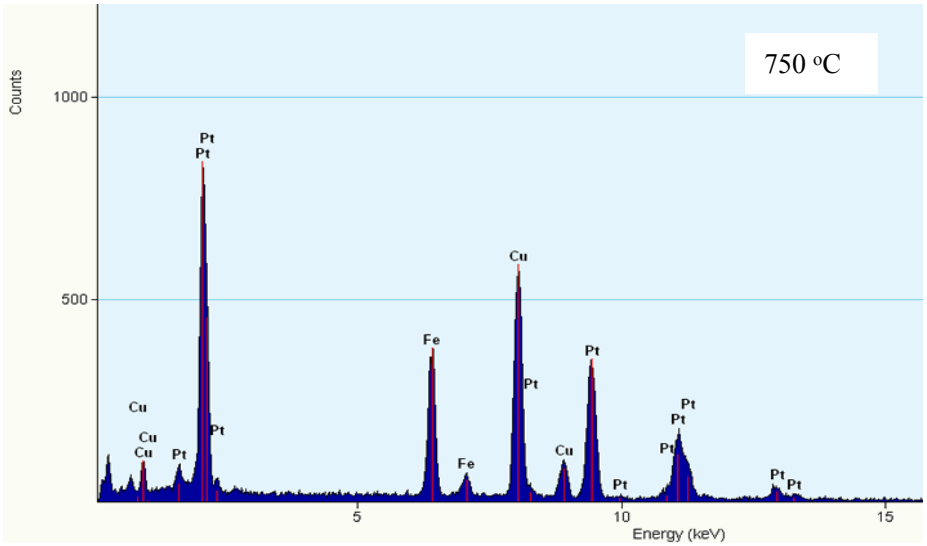


Figure S3. The composition of FePt NPs was characterized by EDS. The EDS image of FePt nanoparticles prepared at temperature of 350 °C, 550 °C and 750 °C.

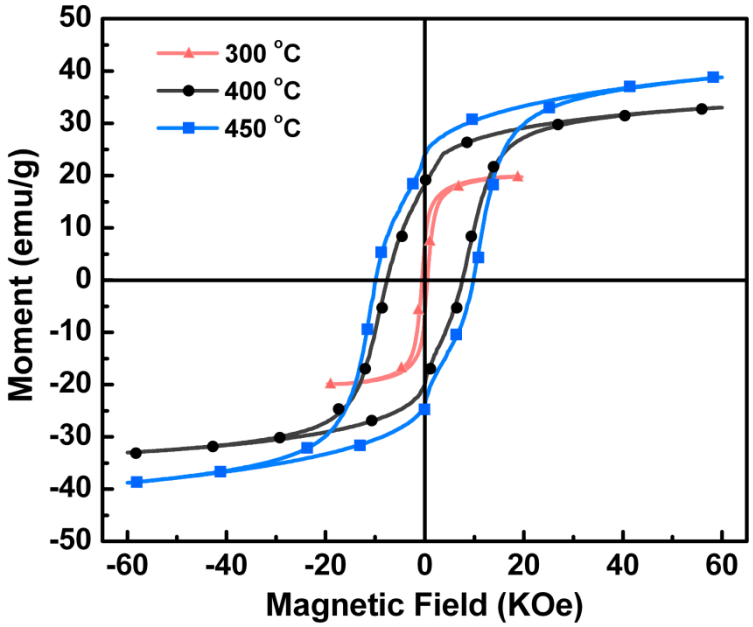


Figure S4. Room temperature magnetic hysteresis loops of the FePt NPs prepared at 300 °C, 400 °C and 450 °C.

Table 1 Temperature dependent of the synthesized FePt nanoparticles size, coercivity and chemical ordering degree.

Temperature (°C)	**300**	**350**	**400**	**450**	**550**	**750**
Average size (nm)	6.6	7.2	8.3	9.8	11.5	15
H_c (Oe)	530	3150	7600	9900	11200	21500
Ordering degree, S	-	-	0.57	0.64	0.66	0.72