Enhanced Microwave Absorption Properties of Ferroferric Oxide/ Graphene composites with Controllable Microstructure

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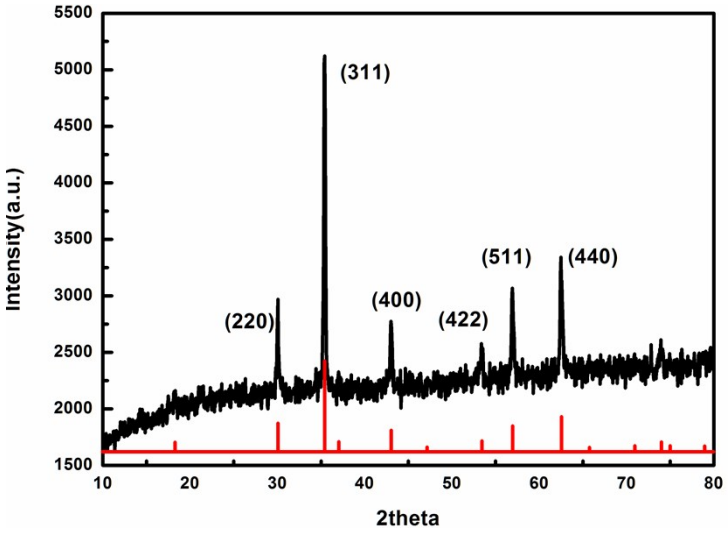

Fig.S1- XRD patterns of Fe_3O_4 nanoparticals and the PDF card NO. 65-3107.

It can be seen that the pattern of Fe_3O4 is in agreement with the standard profile of cubic magnetite Fe_3O_4 (JCPDS card No. 65-3107)

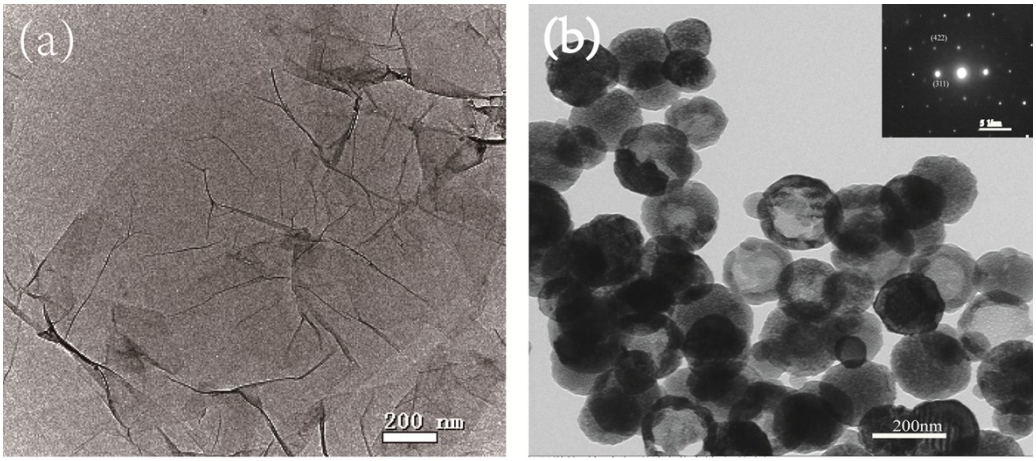

Fig. S2- (a) the TEM image of RGO reduced from GO ; (b) the TEM image of Fe_3O_4, and the inset of (b) shows the SAED pattern of Fe_3O_4 nanoparticles;

The image of RGO indicates that the graphene is crumple and transparent (shown in fig. S2 a), and the Fe_3O_4 nanoparticles show a well hollow structure with a 200 nm in size and 20 nm of the thickness (shown in fig. S2 b)

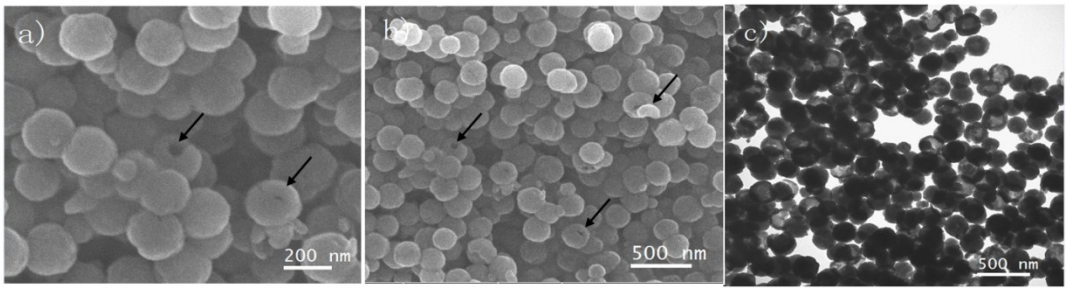

Fig. S3-(a) (b) the high and low SEM images and (c) the TEM image of Fe_3O_4 nanoparticles;

The Fe_3O_4 nanoparticles have been synthesized by solvothermal method. And the particles are well monodisperse with the size of about 200nm. And in the SEM, it can be found many opening which have been marked by the arrows

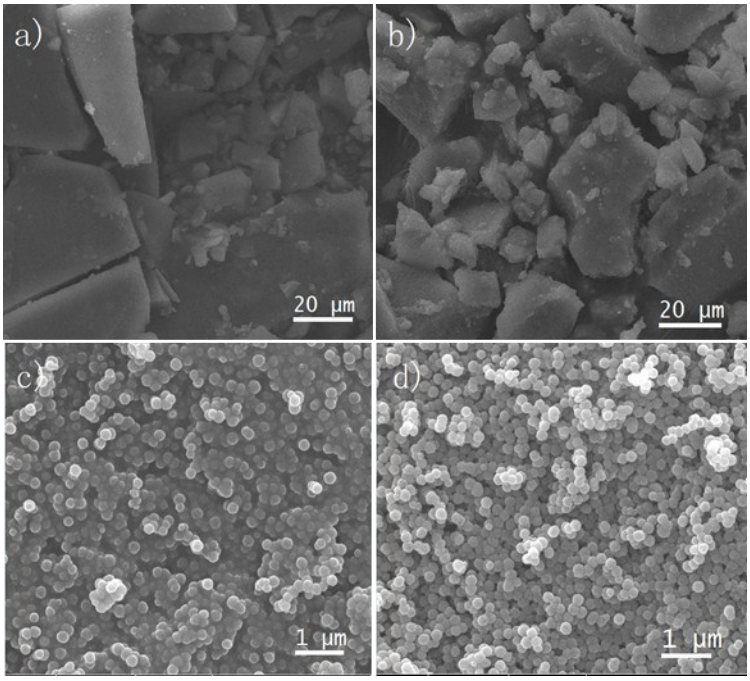

Fig. S4- the SEM images of the time control for the pure Fe_3O_4 nanoparticles (a) 3h, (b)6h (c) 9h,(d)12h

From the SEM images, when the time is 3h and 6h, there are no apparent particles. After 9h, the particles have been initially formed, and after 12h, many monodisperse nanoparticles are synthesized.

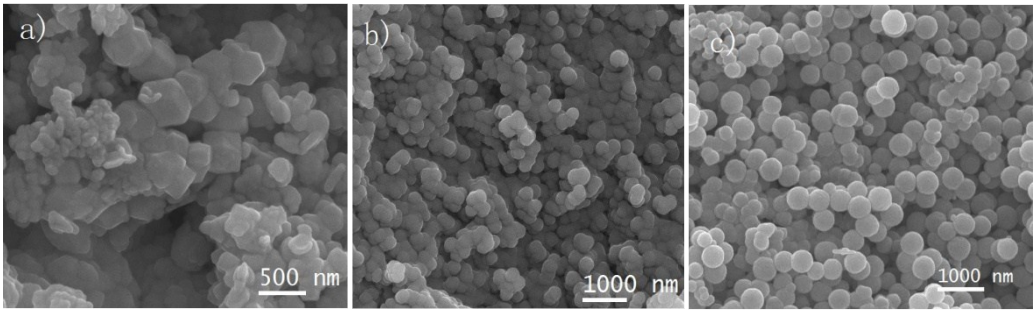

Fig. S5- the SEM images of the products of different mass ratio of $FeCl_3.6H_2O$ and urea (a)1:0.5,(b)1:1,(c)1:2

From the SEM images of the different mass ratio of the ferric salt and urea, the best mass ratio is 1:2 which can transform to monodisperse nanoparticles with the size of ~200nm.

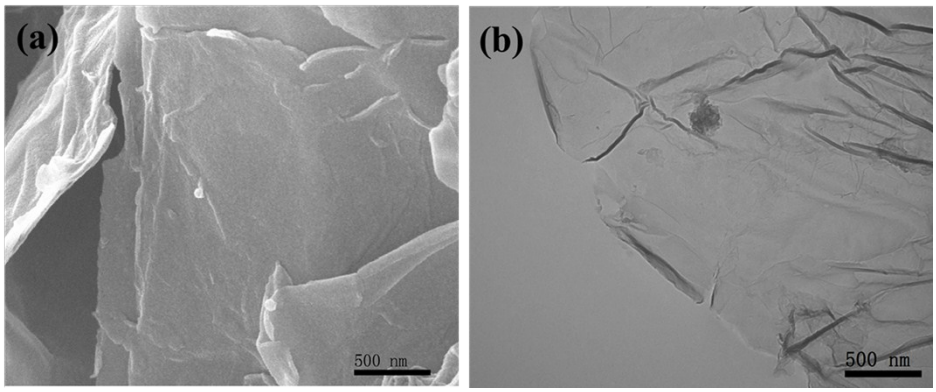

Fig.S6- (a) SEM and (b) TEM images of the composites of Sample 4

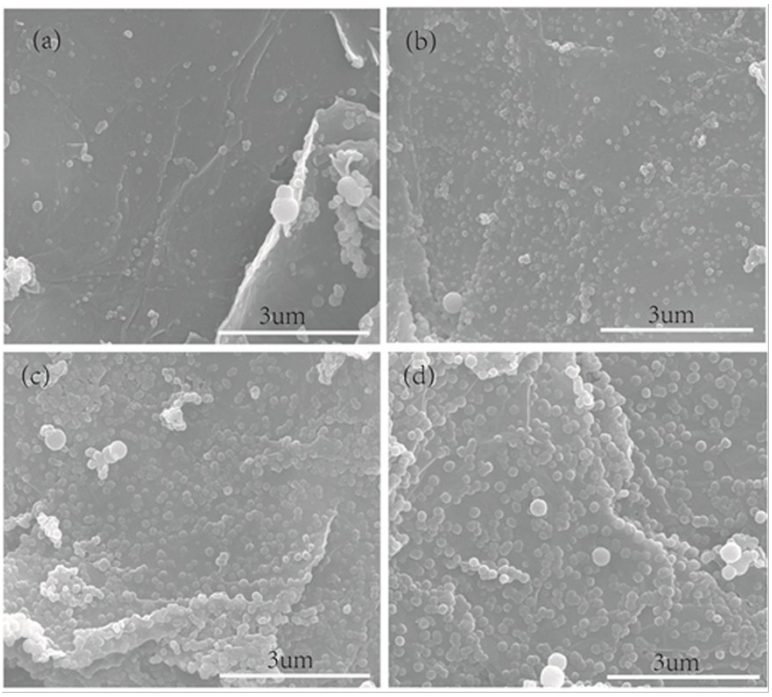

Fig. S7 the SEM images of Sample 1 with different time

(a) 10 h; (b) 12 h; (c) 14 h; (d) 16 h

Fig. S7 shows the morphology of Sample1 with different time. It indicates that with the time increases, the there are two kinds of Fe_3O_4 nanoparticles in Sample1 : someone is linked on the graphitic layers and their growth is limited, the others are free from the layers ,and they become much bigger than the former.