Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Supporting information

Nitrogen-doped graphene layers encapsulated NiFe bimetallic nanoparticles synthesized by arc discharge method for high-efficient microwave absorber

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Outline

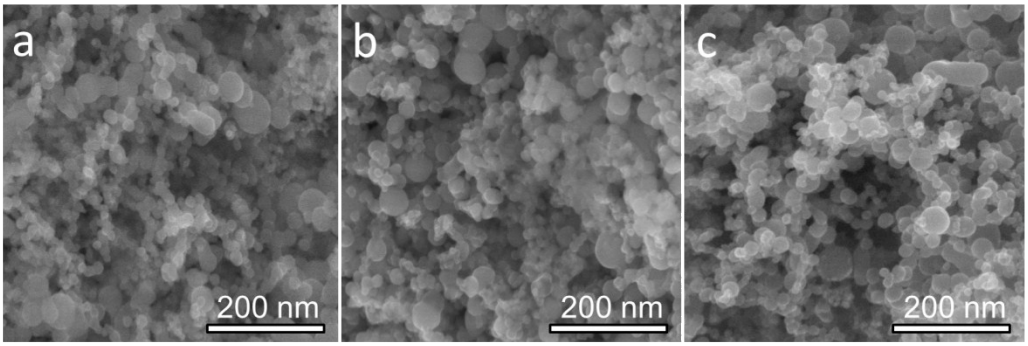

Fig. S1. SEM images of the as-made NiFe@NC nanoparticles, (**a**) S1, (**b**) S2 and (**c**) S3. From these images, it can be seen that all of the three samples are composed of irregular spherical particles less than 100 nm in size.

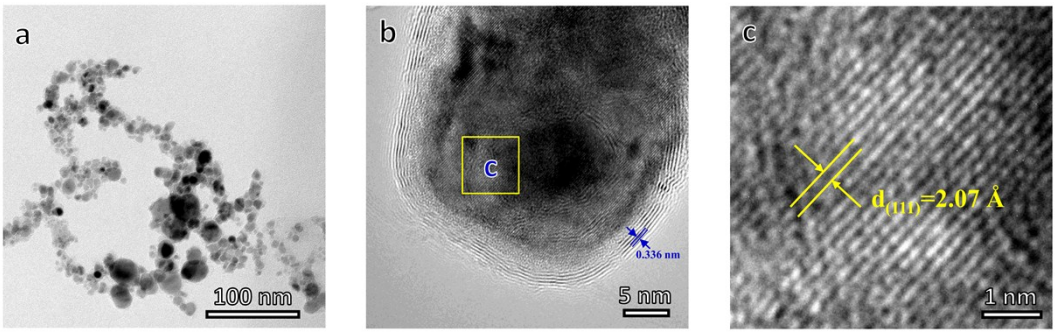

Fig. S2. TEM (**a**) and HRTEM (**b** and **c**) images of the prepared NiFe@C nanoparticle (S0).

As shown in Fig. S2a, one can see that the NiFe@C sample (S0) exhibit irregular spherical shape and its corresponding particle size distributes in 20~50 nm. The HRTEM image in Fig. S2b further reveals the detailed microstructural of sample S0, in which the out shell is demonstrated as graphene layers with a lattice separation of 3.36 Å. Furthermore, the lattice fringes with d=2.07 Å shown in Fig. S2c are indexed to the (111) planes of cubic NiFe alloy (JCPDS #47-1417).

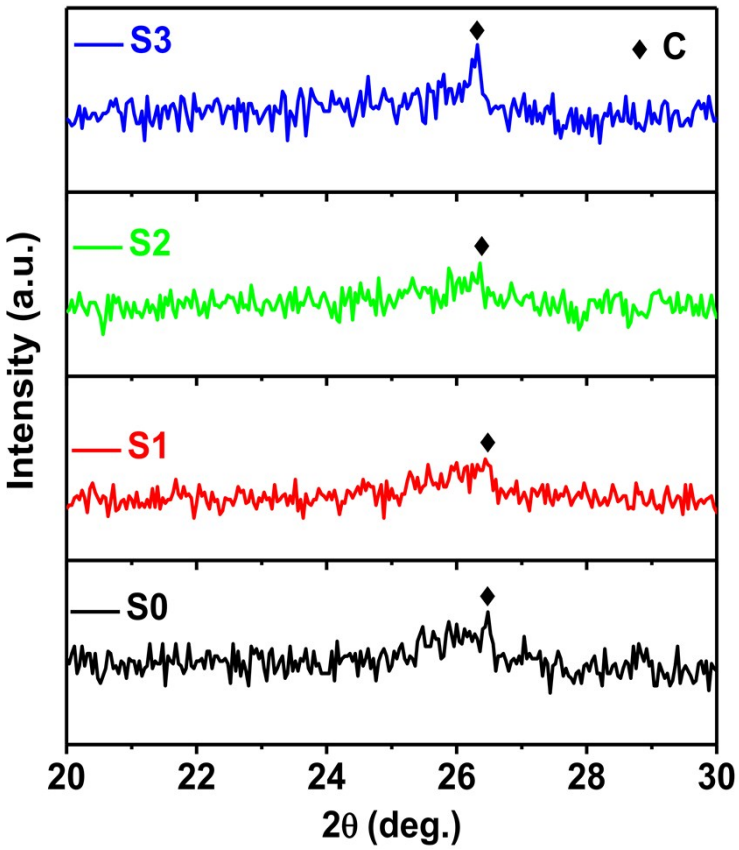

Fig. S3. Enlarged XRD patterns from 20° to 30° of the as-prepared samples S0 (black), S1 (red), S2 (green) and S3 (blue).

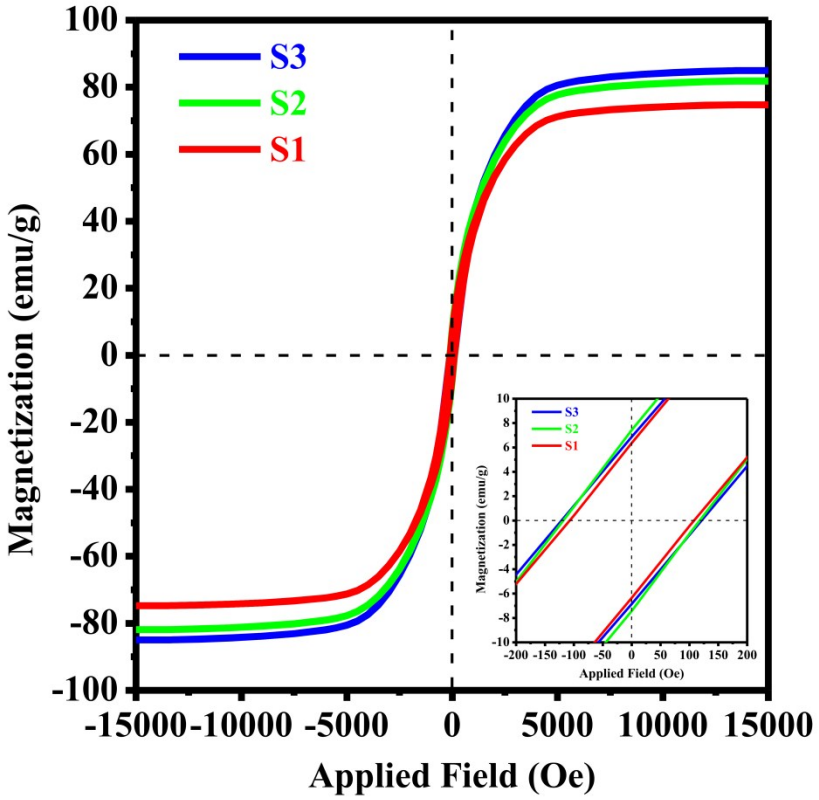

Fig. S4. Magnetization hysteresis loops of the as-prepared samples S1 (red), S2 (green) and S3 (blue).

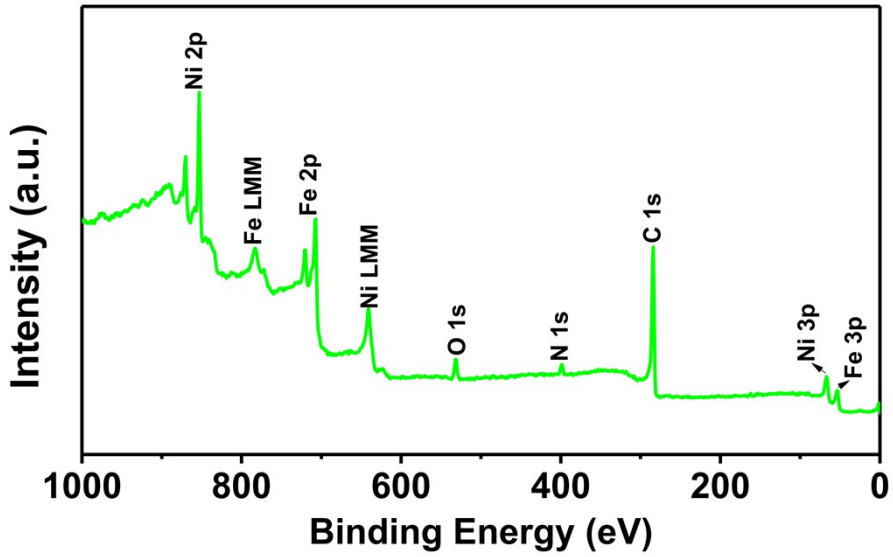

Fig. S5. Survey XPS spectrum of sample S2.

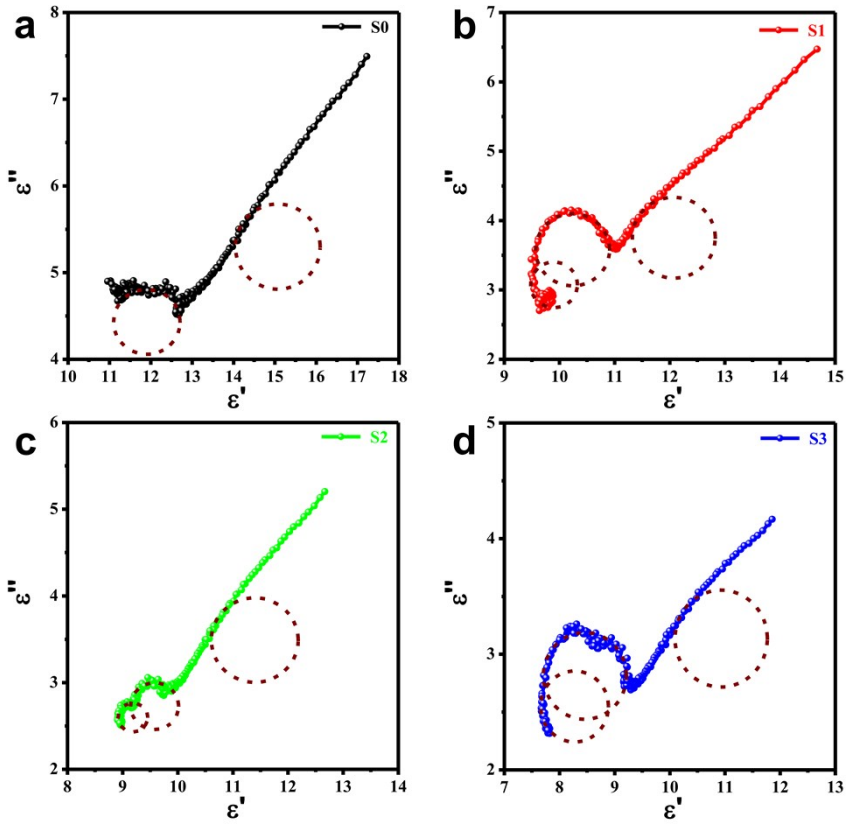

Fig. S6. The Cole-Cole circles of samples S0 **(a)**, S1 **(b)**, S2 **(c)** and S3 **(d)**.