**Supporting information for**

# FeNi Alloy and Nickel Ferrite Codoped Carbon Hollow Microspheres for High Efficient Microwave Absorption

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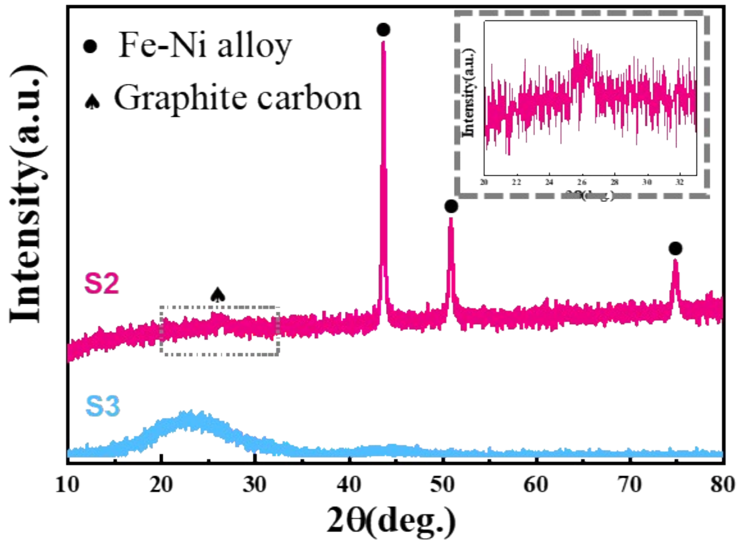


Fig. S1. XRD patterns of the S2 (A) and S3 (B). The upper-right inset of (A) is the magnified XRD pattern of the section denoted by the red rectangular on the main pattern.

Table S1. The carbon content of different samples.

| Sample | The content of carbon (wt%) |
| --- | --- |
| **S1** | 20.7% |
| **S2** | 21.4% |

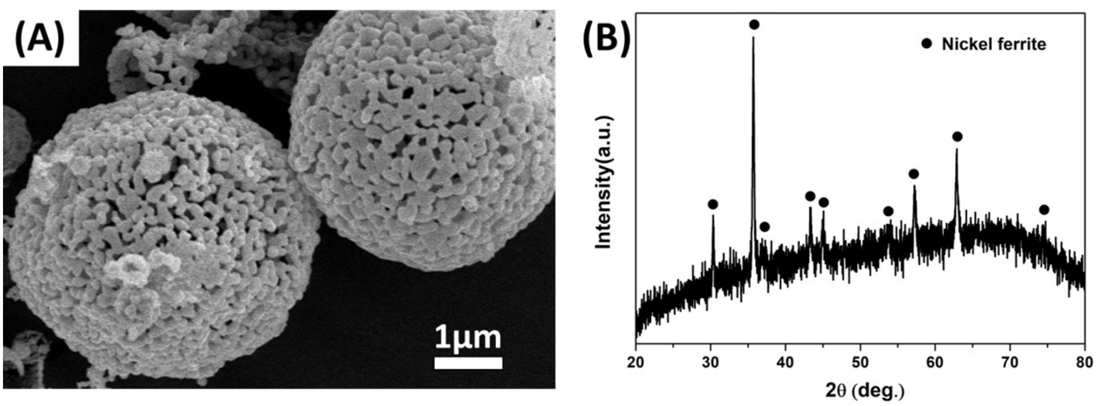

Fig. S2. SEM image (A) and XRD pattern of the hollow microspheres obtained through calcination of the intermediate particles in air atmosphere.

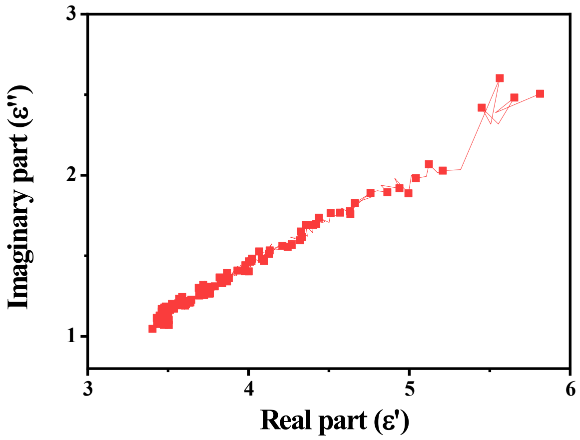


Fig. S3. Cole-Cole semicircles (ε′ versus ε″) of S3.

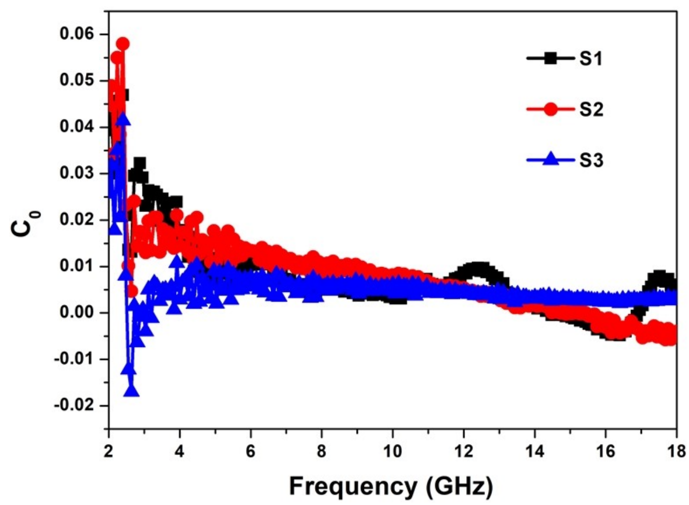


Fig. S4. Frequency dependence of the eddy current coefficient ($C_0$) of different samples.

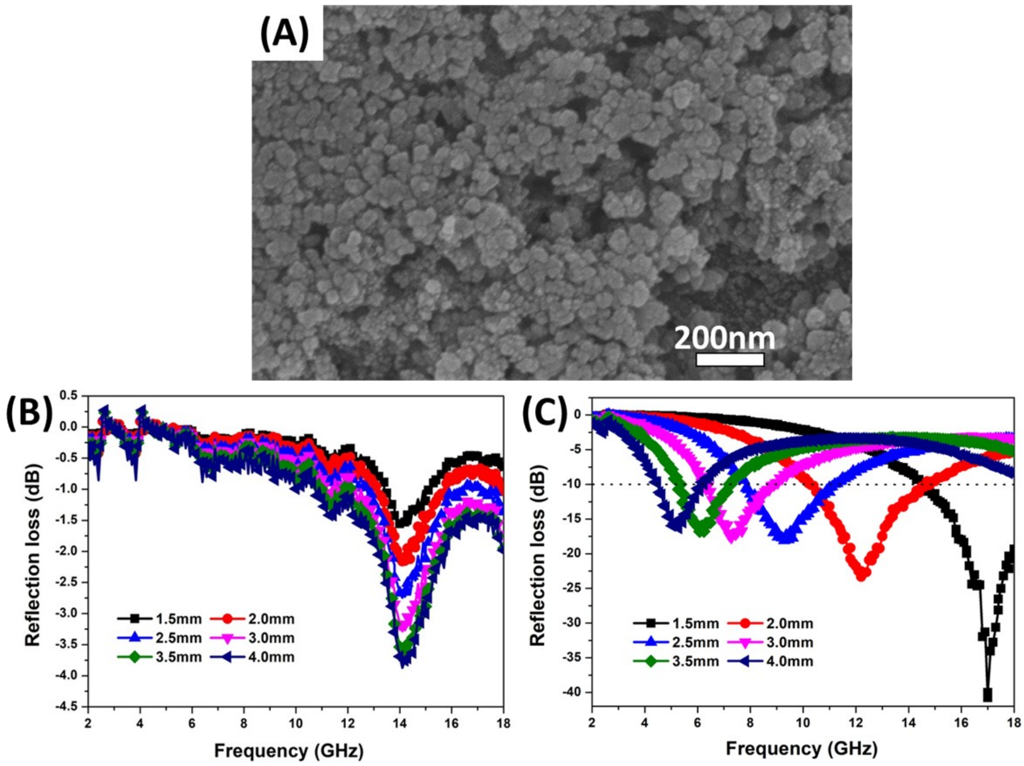


Fig. S5. SEM image (A) and frequency dependence of microwave reflection losses of the mashed CAFHM at different filling ratio (B 30 wt%, C 60 wt%).

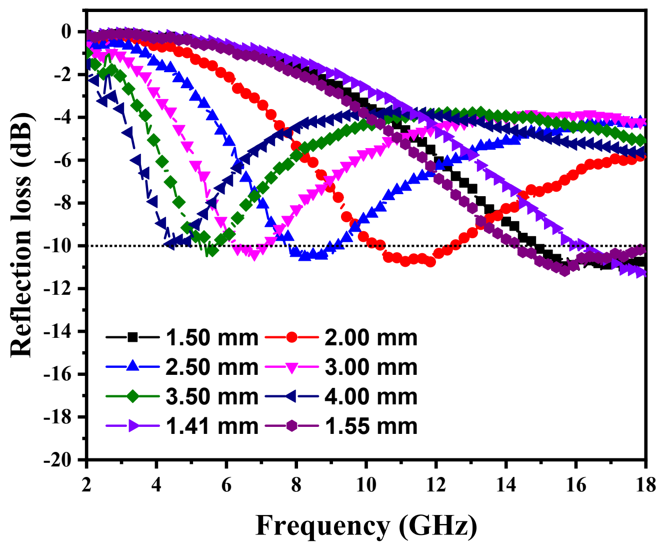


**Fig. S6.** The frequency dependence of microwave reflection losses of the hollow microspheres CAFHM at the filling ratios of 60%.

As suggested, the microwave absorption performance of the hollow microspheres CAFHM was investigated at the filling ratios of 60% (Fig. S7). As shown in Fig. S7, at a high filling ratio of 60%, the microwave absorption performance get worse when compared with that obtained at a lower filling ratio of 30%. The reason of the performance degradation can be attributed to the fact that the hollow microspheres of CAFHM at high filling ratio are more likely to contact with each other to form a conductive network, which leads to serious impedance mismatch, resulting in poor absorption performance. This also illustrates the merit of the hollow structure, which lies in the achievement of high performance at low filling ratio. On the other hand, for the mashed CAFHM, a fair performance can be achieved only at high filling ratio of the absorbent, indicating its disadvantage from the points of view of economical efficiency and lightweight design.