

Supporting information

**Negative imaginary parts of complex permeability and microwave
absorption performance of core double-shelled FeCo/C/Fe_{2.5}Cr_{0.5}Se₄
nanocomposites**

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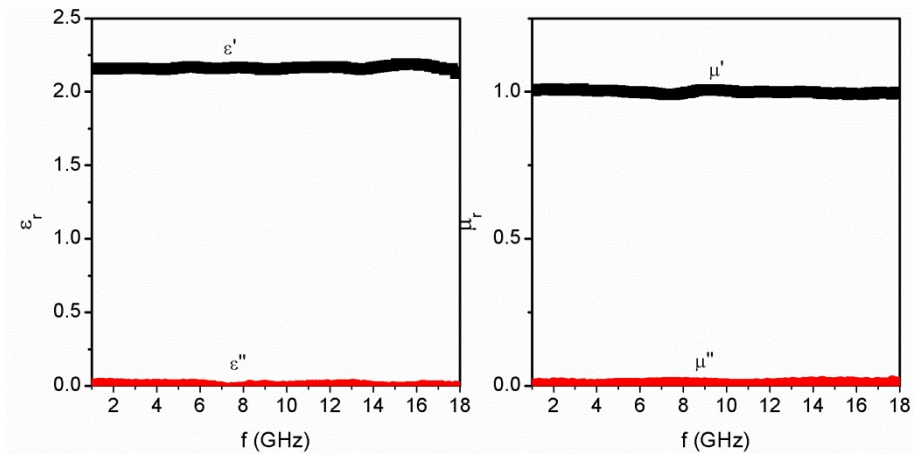


Fig. S1. Frequency dependence of ϵ_r and μ_r of the paraffin matrix.

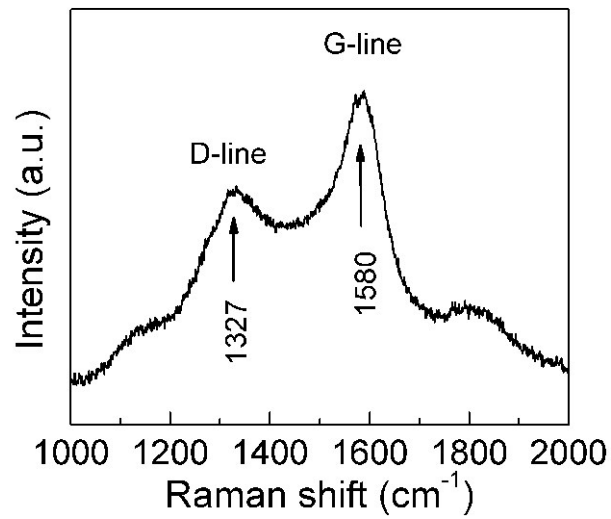


Fig. S2. Raman spectrum of carbon shell in the FeCo/C nanocapsules recorded at room temperature.

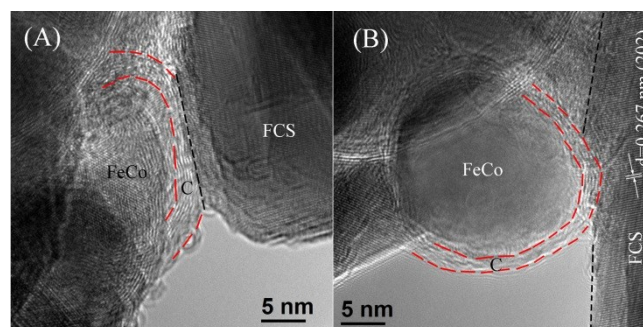


Fig. S3. High-resolution TEM images of the $(x=0.1)\text{FeCo/C/Fe}_{2.5}\text{Cr}_{0.5}\text{Se}_4$ (FCS) nanocomposite.

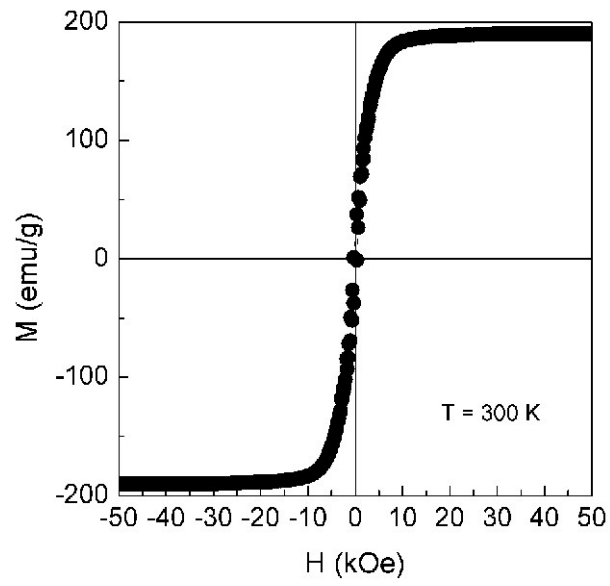


Fig. S4. Magnetic hysteresis loops of the FeCo/C nanocapsules measured at 300 K.

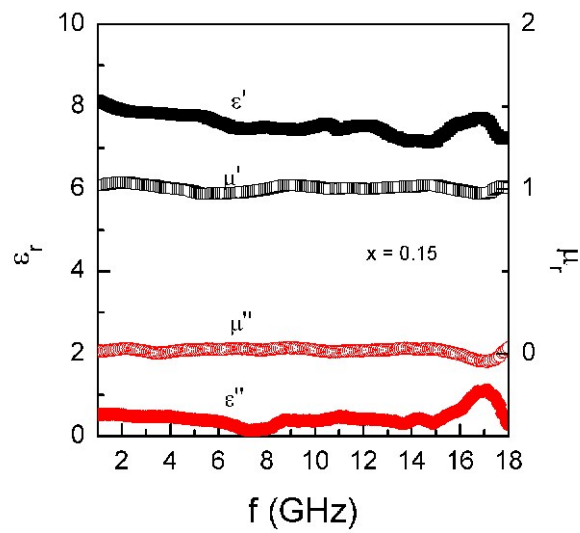


Fig. S5 Frequency dependence of the ϵ_r and the μ_r of the (x)FeCo/C/FCS-paraffin composite with $x=0.15$.

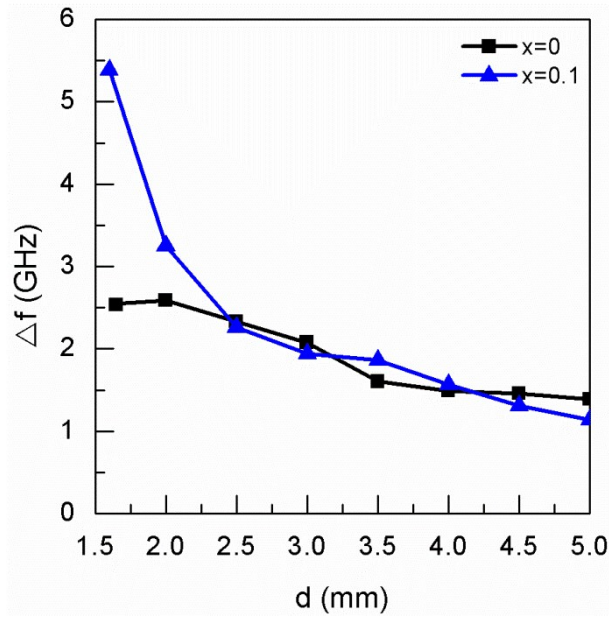


Fig. S6 Thickness dependence of the bandwidths (Δf) of the (x)FeCo/C/FCS-paraffin composite with $x=0$ and 0.1 .

The absorption bandwidth (Δf) is the frequency range with $RL \leq -10$ dB.

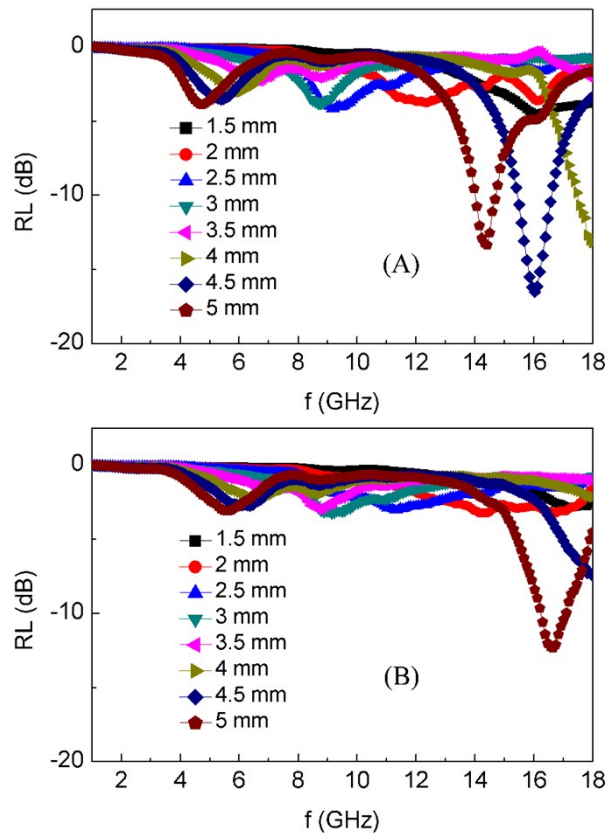


Fig. S7. Frequency dependences of RL of the (x)FeCo/C/FCS-paraffin composites with (A) $x=0.05$ and (B) $x=0.15$ at different absorbent layer thickness.

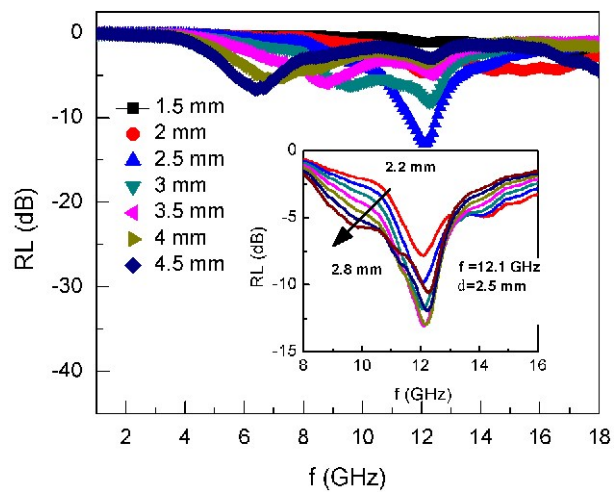


Fig. S8. Frequency dependence of RLs of the $(x=0.2)\text{FeCo/C/FCS-paraffin}$ composite. The inset shows the RL- f spectra at different absorber layer thickness.