Electronic Supplementary Material (ESI) for Nanoscale.
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Supporting Information for

Dandelion-like Carbon Nanotube Assembly Embedded with Closely-Separated Co Nanoparticles for High-Performance Microwave Absorption Materials

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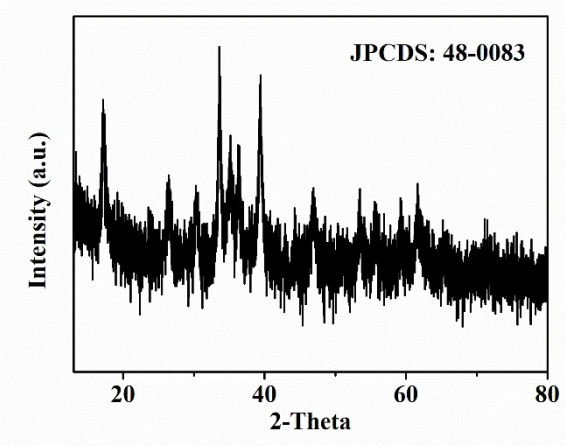

Figure S1. The XRD pattern of $Co(CO_3)_{0.5}(OH)_x$ precursor.

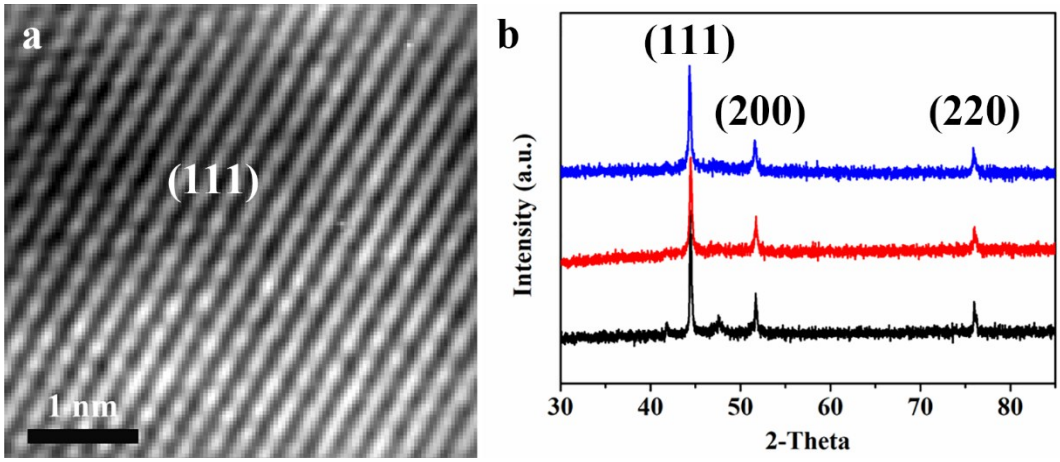

Figure S2. The high-resolution TEM figure (a) of HCTCo-4 and XRD of the HCTCo-2/4/8 (black/red/blue lines, b)

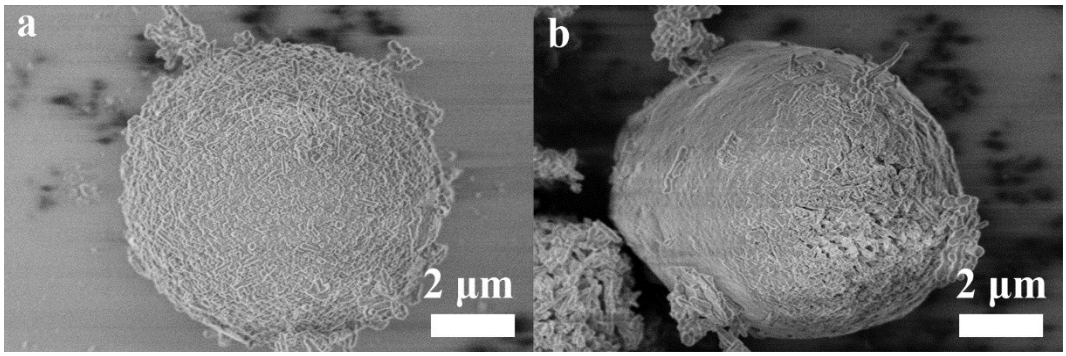

Figure S3. The $Co(CO_3)_{0.5}(OH)_x$@PDA composites prepared with the aid of alkaline reagents: Tris buffer (a) and ammonium hydroxide (b).

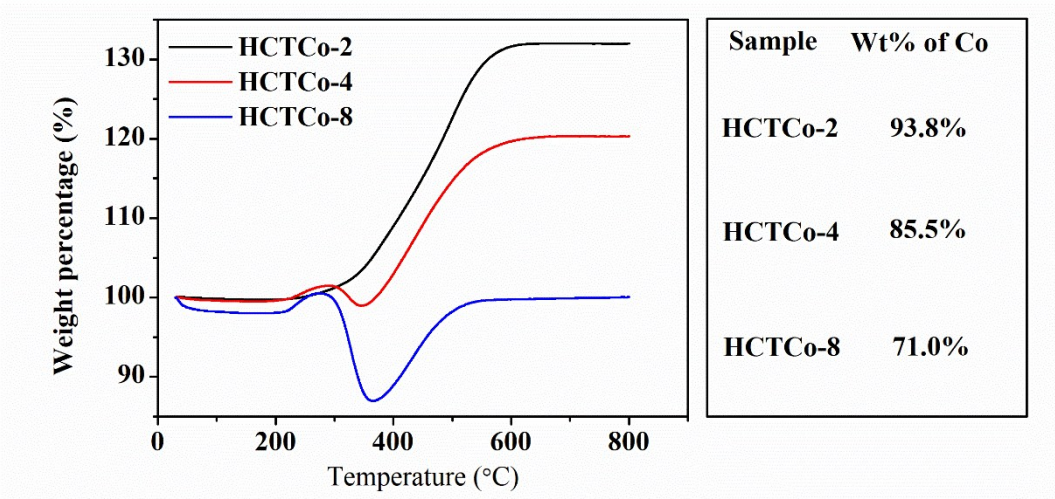

Figure S4. The TGA curves and calculated weight fractions of Co in HCTCo composites

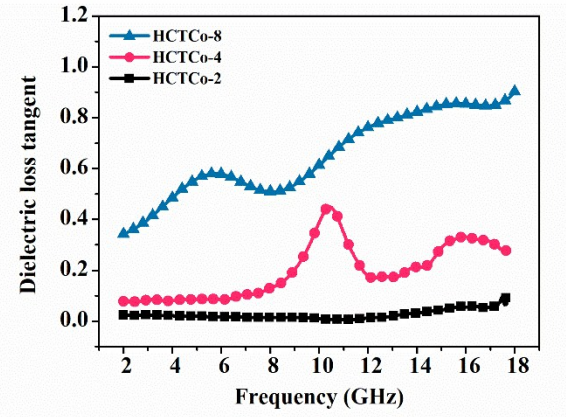

Figure S5. The dielectric loss tangents of HCTCo composites.

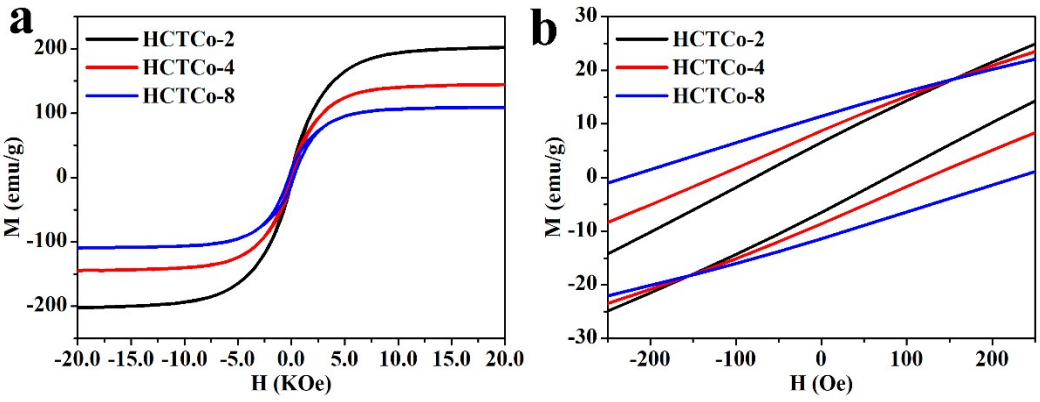

Figure S6. The hysteresis loops of HCTCo composites.

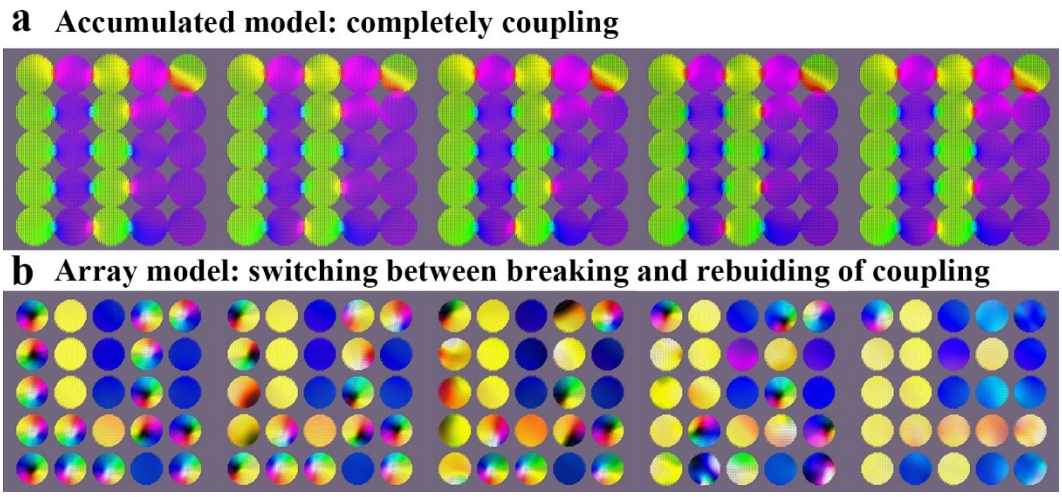

Figure S7. The overall magnetic moment dynamics of accumulation (a) and array (b) models. The negligible variation of magnetic moment and stable magnetic coupling effect in the accumulation model suggest that the stacked magnets will interact with the microwave field slightly, leading to the inferior magnetic loss capacity. In the array model, the magnetic coupling interaction is frequently broken and rebuilt among the closely-spaced nanomagnets, which further results in the irreversible magnetic hysteresis. Such a dynamic magnetic coupling interaction network accompanied by the dramatical variation of interior magnetic moments intensively consumes the microwave energy, which is represented by the strong magnetic loss capacity.