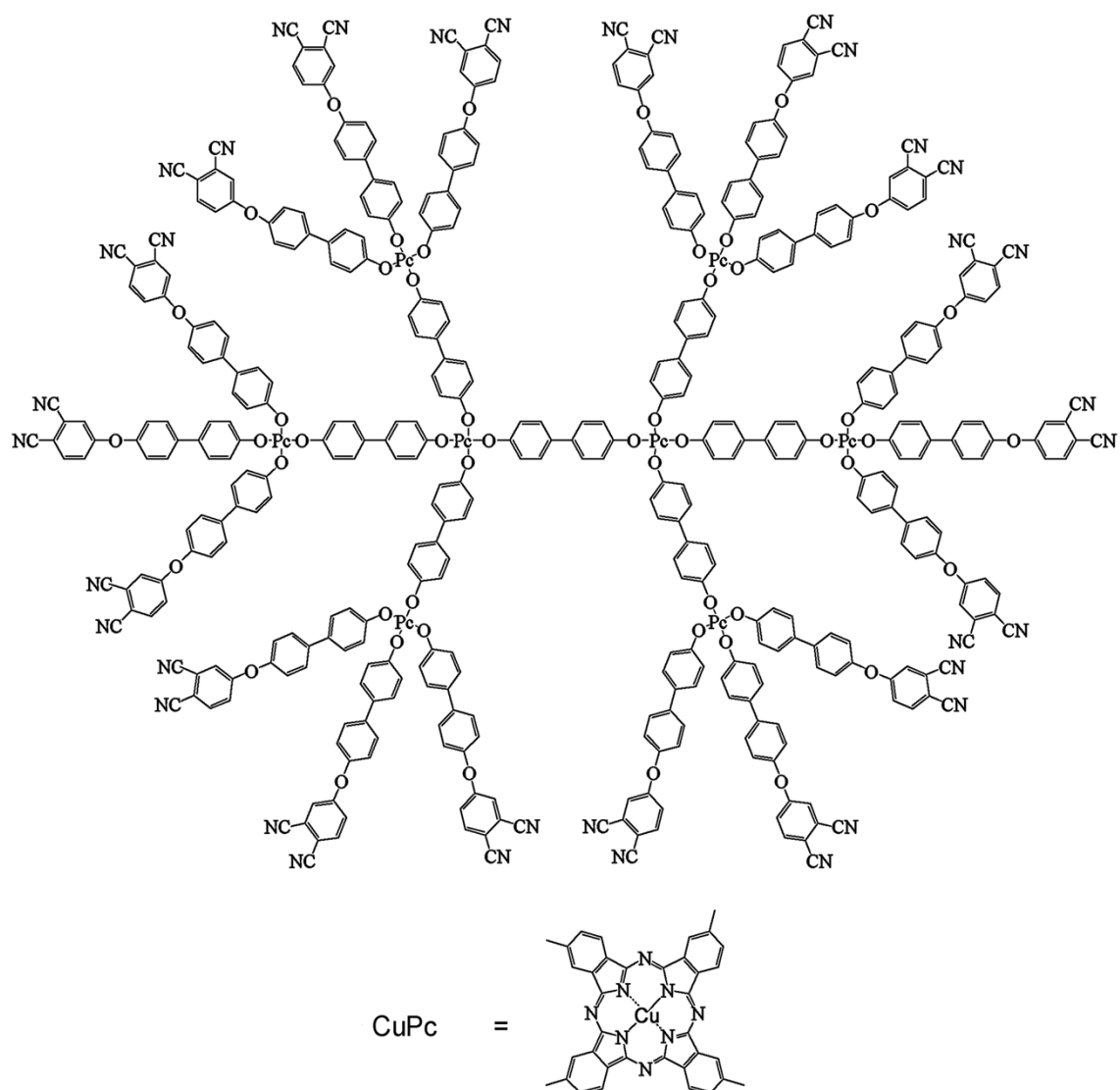


Supporting Information

Hyperbranched copper phthalocyanine decorated Fe₃O₄ microspheres with extraordinary microwave absorption properties

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Scheme S1. Chemical Structure of the HBCuPc

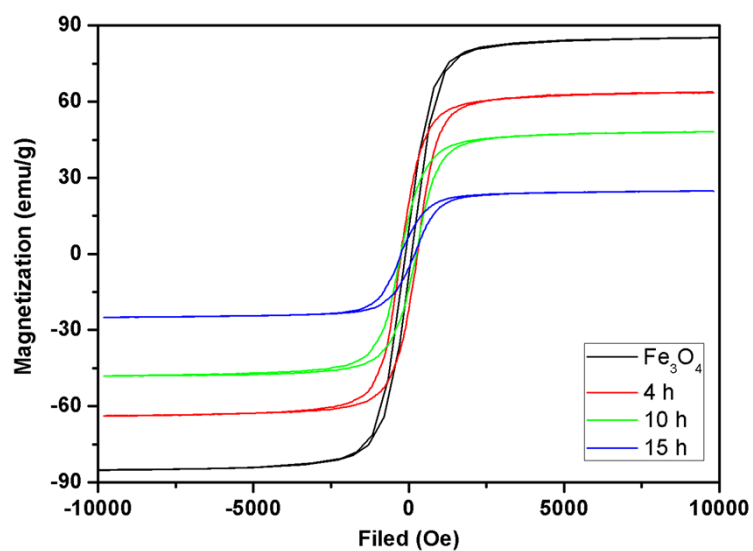


Figure S1. Magnetization curves applied magnetic field at room temperature of Fe₃O₄ and Fe₃O₄/HBCuPc composites with different treatment time

Table S1 Magnetization data for Fe₃O₄/HBCuPc with different treatment time

Sample	Hc (Oe)	Ms (emu g ⁻¹)
Fe ₃ O ₄	188.3	82.7
Fe ₃ O ₄ /HBCuPc-treated 5h	247.1	63.5
Fe ₃ O ₄ /HBCuPc-treated 10 h	242.5	48.1
Fe ₃ O ₄ /HBCuPc-treated 15h	240.4	24.7

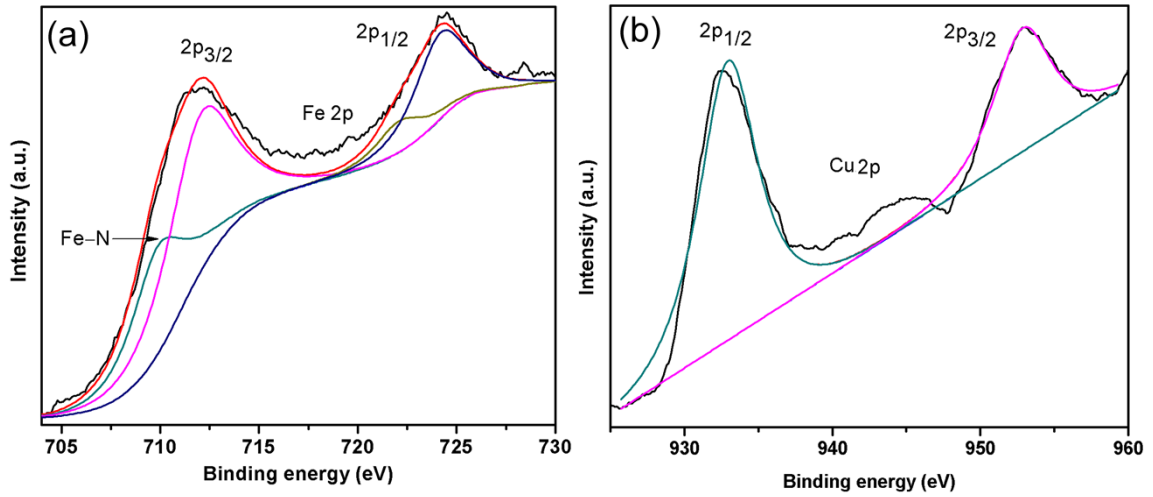


Figure S2. XPS spectra of Fe 2p (a) and Cu 2p (b) for Fe₃O₄/HBCuPc

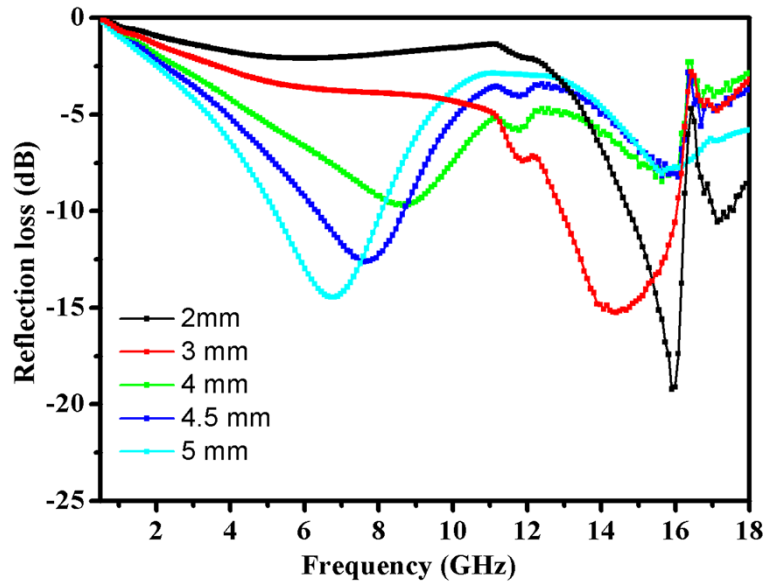


Figure S3. The reflection losses of Fe₃O₄ in different thickness of Fe₃O₄.

Table S2 Absorption properties of the Fe₃O₄-based magnetic materials

phase composition	optimum thickness (mm)	optimum frequency (GHz)	R _{Lmax} (dB)	absorption bandwidth (<-10 dB, GHz)
Fe ₃ O ₄ /PEDOT ¹	4	9.5	-30	4
Fe ₃ O ₄ /r-GO ²	2	12.9	-24	4.9
Fe ₃ O ₄ /TiO ₂ ³	5	17.3	-20.6	3
Fe ₃ O ₄ /SnO ₂ ⁴	4	16.7	-27.4	5
Fe ₃ O ₄ /PPy ⁵	2.3	12.9	-22.4	5
Fe ₃ O ₄ /CuPc ⁶	2.6	12.6	-35	2

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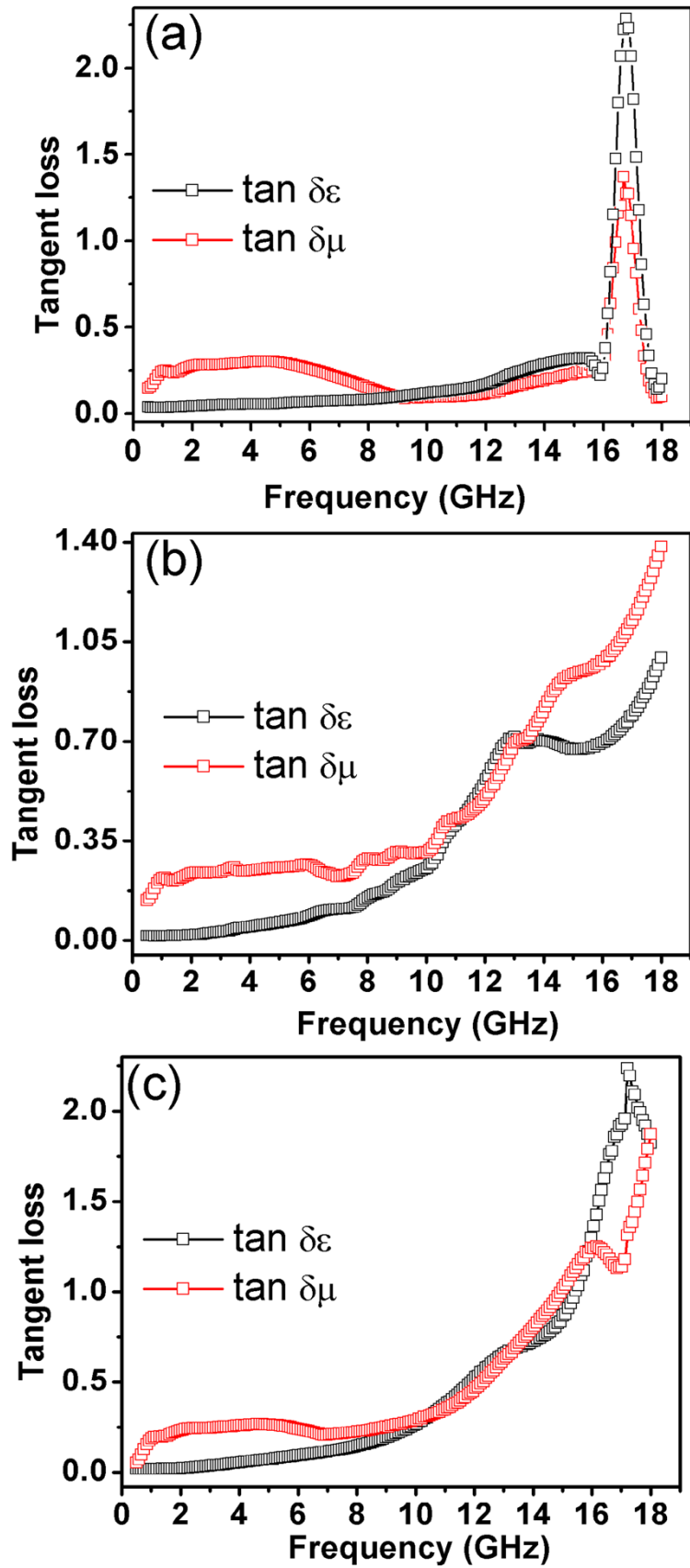


Figure S4. The relationships between $\tan \delta\epsilon$ and $\tan \delta\mu$ of Fe₃O₄/HBCuPc with different treatment time (a) 5 h, (b) 10 h and (c) 15 h