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Supporting Information for

Preparation and microwave absorption performance of a flexible

Fe₃O₄/nanocarbon hybrid buckypaper and its application in composite materials

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S1. The characterizations in Experimental section

Fourier transform infrared (FT-IR) spectra of the buckypapers were obtained by using an IS10 instrument (Nicolet, USA) in the range 4000–400 cm⁻¹. X-ray photoelectron spectroscopy (XPS) was performed using a Kratos Axis Ultra DLD spectrometer with a monochromatic Al K α X-ray source. The morphologies of the buckypapers and composites were characterised through scanning electron microscopy (SEM, Quanta 600FEG, FEI, USA). The lamellar structure of GO was characterised by transmission electron microscopy (TEM, FEI, USA). The tensile strengths of the buckypapers were measured using an Edberg tensiometer. The mechanical properties of the composites were determined at ambient temperatures according to the GB/T 1449-2005 GB/T 1450.1-2005 and GB/T 1447-2005 methods using a UTM5000 united testing system (Xinsansi, Shenzhen). The electromagnetic RL values of the buckypapers and composites were characterised by a Hitachi Anritsu MS4644A vector network analyser using the waveguide method in the range of 2.0–18.0 GHz.

S2. Comparison of microwave absorption performance of the Fe₃O₄/nanocarbon hybrid materials

Table S1.	Comparison	of microwave	absorption	performances	of the
				r	

Materials	Thickness of absorbing layer(mm)	RL (dB)	Frequenc y (GHz)	Ref.
Fe ₃ O ₄ /CNT buckypaper	0.1	-12.6	17.72	[8]
GO@Fe ₃ O ₄ -FePc	2.5	-27.9	10.8	[28]

Fe₃O₄/nanocarbon hybrid materials

Fe ₃ O ₄ /GO buckypaper	0.02	-41.0	16.5	This work
buckypaper	0.04	-20.4	10.5	T HIS WOFK
Fe ₃ O ₄ /MWCNT	0.04	26.4	16.2	This work
α-Fe ₂ O ₃ /RGO	0.01	-32.3	12.5	[33]
RGO/Fe ₂ O ₃	2.0	-38.0	14.78	[31]

S3. The typical stress-strain and force-displacement curves of composite materials



Figure S1. The typical stress-strain curves of composite materials obtained by tensile



Figure S2. The typical force-displacement curves of composite materials obtained by

bending test.