Electronic Supplementary Information

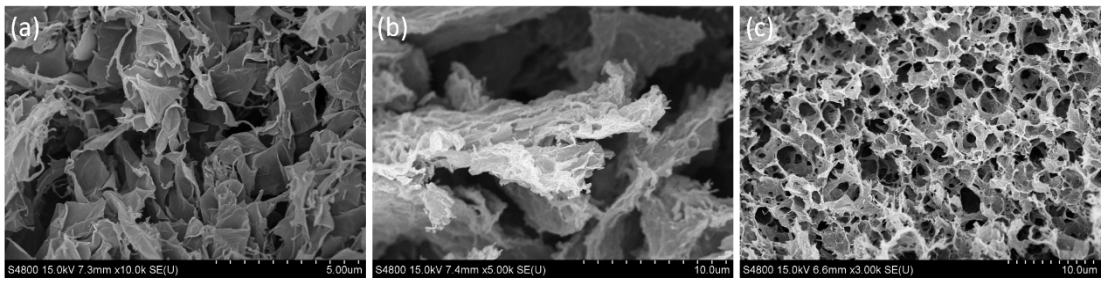

Fig. S1 SEM image of GO (a), CMG (b), 3D-RGO (c).

S1 Sorption capacity test

The method developed for the measurement of oil and water sorption capacity of the sorbent was based on *ASTMF726-99: Standard Test Method for Sorbent Performance of Adsorbents*.

Kerosene (200 ml) was poured into a 500 ml beaker. The sorbent was weighed and the value recorded, and then it was immersed in the oil. In general, after 60 minutes of immersion, the sorbent was removed and allowed to drain for 5 minutes. The saturated sorbent was then immediately transferred to a pre-weighed weighing bottle and weighed. For the continued reuse of the sorbent, the saturated sorbent was removed to an flask and the extracted with petroleum ether (boiling range 60-90 °C) several times; subsequently, the sorbent was dried at 65 °C for 30 minutes for use in the next oil sorption test. The cycle of sorption and recovery was repeated 10 times to characterize the recycling performance. The oil sorption of the sorbent was calculated using the following equation:

$$\text{oil sorption (g g}^{-1}) = \frac{S_t - S_0}{S_0} \qquad (1)$$

where S_0 is the initial dry weight of the sorbent and S_t is the weight of the sorbent

with oil absorbed. Solvent sorption capacity measurements were carried out similarly. All tests were performed at room temperature.

S2 Dye-uptake experiments

The dyes, methyl orange (MO), methyl blue (MB), and rhodamine E (RE), were dissolved in distilled water to form solutions with an initial concentration of 1mmol L^{-1}. Then the sorbent was added to the above solution and the dye-uptake experiment was performed at room temperature. The concentration of the dye solutions was determined by UV-vis spectroscopy. The dye-uptake of the sorbent was expressed as the equilibrate absorption capacity of the dye per unit mass of the aerogel and calculated as follows:

$$Q_{eq} = \frac{(C_i - C_{eq})VM_d}{m_{ga}} \quad (2)$$

where Q_{eq} (mg g^{-1}) is the absorption capacity; C_i (mmol mL^{-1}) and C_{eq} (mmol mL^{-1}) are the initial and final concentration of the dye solution; V (mL) is the volume of the dye solution; M_d (mg $mmol^{-1}$) is the molecular weight of the dye; m_{ga} (g) is the weight of the sorbent.

Tab. S1 Typical PPy based nanocomposites for EA materials (PBOPy: polybenzobisoxazole; Z-BCF: Z-type barium ferrite)

Filler	Matrix	Loading ratio	RL_{max} (dB)	Thickness (mm)	Frequency range (GHz) (RL below − 10 dB)	Effective bandwidth (GHz) (RL below − 10 dB)	References
S-PPy/RGO	Paraffin	10.0 wt%	− 54.4	3.0	10.20-16.96	6.76	This work
RGO/PPy/Co_3O_4	Paraffin	50.0 wt%	− 43.5	3.2	8.90-15.30	6.40	1 (2013)
PPy/RGO/Co_3O_4	Paraffin	50.0 wt%	− 33.5	2.5	11.64-18.00	6.36	2 (2013)
PBOPy/PPy/Fe_3O_4	Paraffin	30.0 wt%	− 23.3	3.5	11.60-13.84	2.24	3 (2014)
RGO/PPy/$CoFe_2O_4$	Paraffin	50.0 wt%	− 50.8	1.5	12.70-16.90	4.20	4 (2014)
RGO/PPy/Fe_3O_4	Paraffin	50.0 wt%	− 56.9	5.3	5.31-8.00	2.69	5 (2014)
Z-BCF/SiO_2/PPy	Paraffin	33.3 wt%	−19.6	2.0	12.94-18.00	5.06	6 (2014)
PPy/$BaFe_{12}O_{19}$/ $Ni_{0.8}Zn_{0.2}Fe_2O_4$/RGO	Paraffin	30.0 wt%	−25.5	3.0	7.80-11.60	3.80	7 (2014)

Tab. S2 Typical ICPs based nanocomposites for EA materials (SSP: solid-state polymerization)

Filler	Matrix	Loading ratio	RL_{max} (dB)	Thickness (mm)	Frequency range (GHz) (RL below − 10 dB)	Effective bandwidth (GHz) (RL below − 10 dB)	References
S-PPy/RGO	Paraffin	10.0 wt%	− 54.4	3.0	10.20-16.96	6.76	This work

PEDOT/RGO/Co_3O_4	Paraffin	50.0 wt%	− 51.1	2.0	9.40-12.50	3.10	8 (2013)
PANi/RGO	Paraffin	10.0 wt%	− 36.9	3.5	8.20-13.50	5.30	9 (2014)
3D-RGO/PEDOT	Paraffin	10.0 wt%	− 35.5	2.0	11.50-16.50	5.00	10 (2014)
SSP-PEDOT	Paraffin	50.0 wt%	− 50.1	2.0	10.00-15.90	5.90	11 (2014)
$Ni_{0.6}Zn_{0.4}Fe_2O_4$/PANi	Paraffin	70.0 wt%	− 41.0	2.6	10.62-15.62	5.00	12 (2015)
$Ba_{0.85}RE_{0.15}Co_2Fe_{16}O_{27}$/PANi	Paraffin	60.0 wt%	− 15.1	3.5	6.70-11.30	4.60	7 (2014)

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