Supporting Information

Modifying epoxy resin to resist both fire and water

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The cross-sections of EP and EP-matrix nanocomposites were studied with a SEM observation. From Figure S1a, it is clear that the pure EP has a relatively smooth surface. However, different from pure EP, the obtained $CoFe_2O_4$/EP nanocomposite cross-section surface contains evenly distributed $CoFe_2O_4$@SiO_2 nanopartilces, which demonstrates that the $CoFe_2O_4$@SiO_2 nanopartilces have a good dispersion in EP matrix.

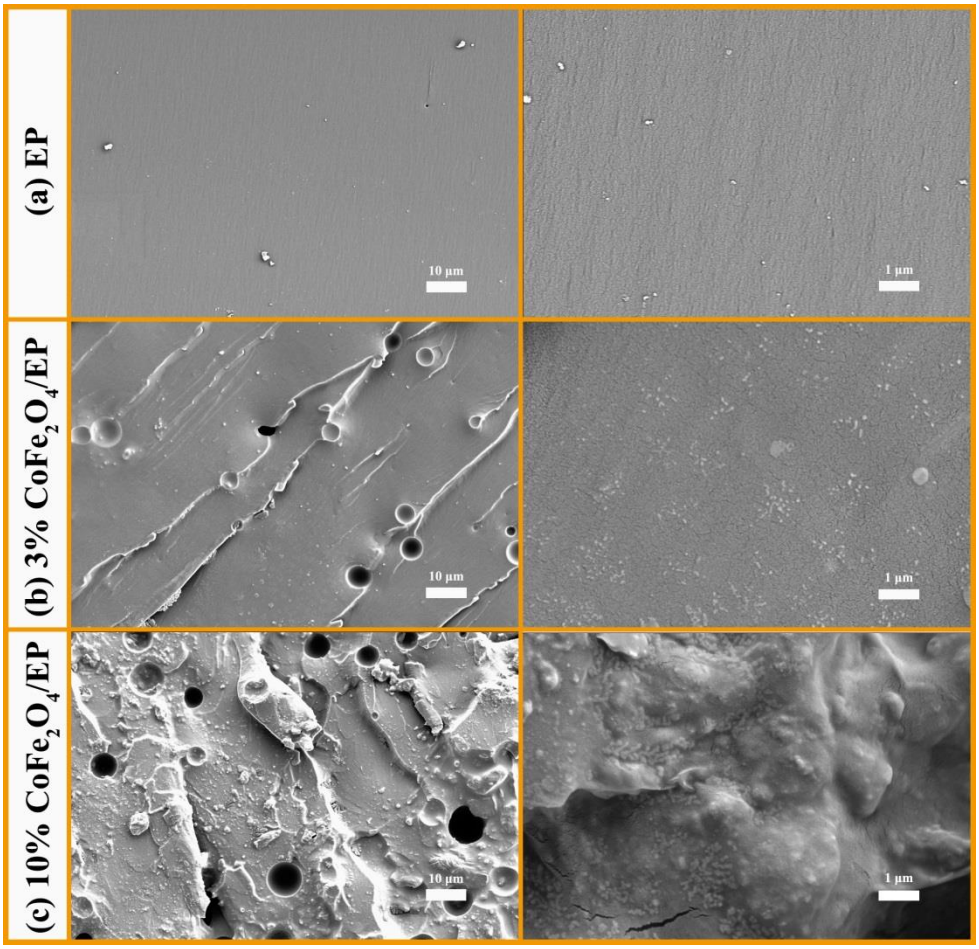

Figure S1 SEM image of fracture surface for (a) EP, (b) 3% $CoFe_2O_4$/EP, (c) 10% $CoFe_2O_4$/EP of the fractured surfaces cryogenically broken after immersion in liquid nitrogen.

Table S1 Thermal analysis data of EP and $CoFe_2O_4$/EP nanocomposites under nitrogen atmosphere

Samples	T_{onest} (℃)	T_{max} (℃)	Residue at 800 ℃ (wt%)
EP	322.5	374.7	7.9
3 wt% $CoFe_2O_4$/EP	320.8	368.8	16.3
10 wt% $CoFe_2O_4$/EP	306.4	353.4	31.5

Table S2 Burning parameters of EP and $CoFe_2O_4$/EP nanocomposites

Sample	*TTI* (s)	*PHRR* ($kW \cdot m^{-2}$)	t_{PHRR} (s)	*COP* ($g \cdot s^{-1}$)	*PSPR* ($m^2 \cdot s^{-1}$)	*TSR* ($m^2 \cdot m^{-2}$)	*FGI* ($kW \cdot m^{-2} \cdot s^{-1}$)	*FPI* ($m^2 \cdot s \cdot kW^{-1}$)	*Weight* (wt%)
EP	87	1128.7	140	0.031	0.320	3744.7	8.06	0.077	7.3
3 wt% $CoFe_2O_4$/EP	62	862.4	160	0.018	0.220	3441.4	5.39	0.072	9.7
10 wt% $CoFe_2O_4$/EP	73	681.9	190	0.012	0.187	3650.1	3.59	0.107	16.2

Video S1

Knife-scratch testing on the surface of superhydrophobic $CoFe_2O_4$/EP.

Video S2

Pressure testing on the surface of superhydrophobic $CoFe_2O_4$/EP.

Video S3

The monolith surface shows superhydrophobicity in air or under oil.

Video S4

Self-cleaning properties of the monolith surface in air or under oil.