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Supporting Information (SI)

Synergic Improvement in Flame Retardant and Dielectric Properties of Hybrid Epoxy Resin Composites Bearing Dimethyl Methylphosphonate-Loaded Zeolitic Imidazole Framework

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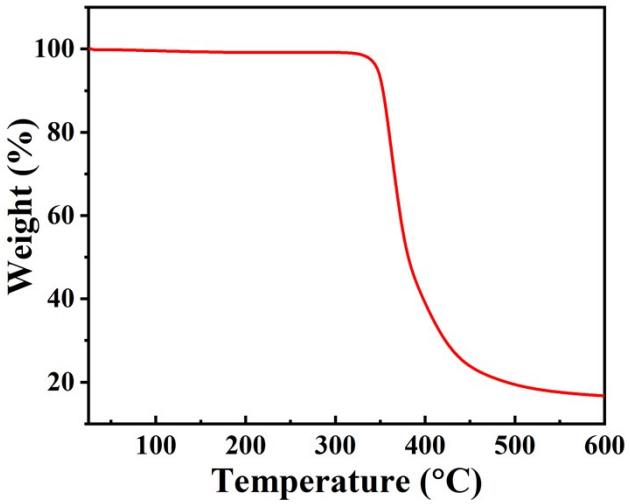

Figure S1. TG curve of EP.

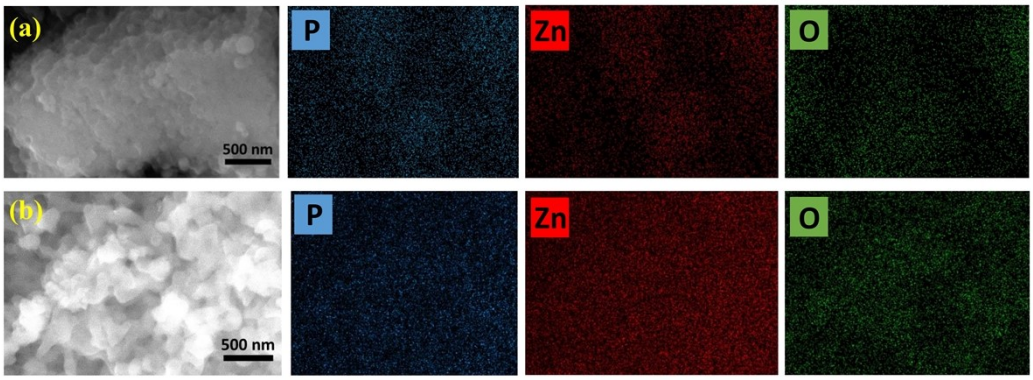

Figure S2. SEM images of (a) ZIF-8@DMMP and (b) ZIF-8@DMMP after 30 min in oven at 250 °C; the corresponding elemental mapping is also indicated at the right side (P: light blue, Zn: red, O: green).

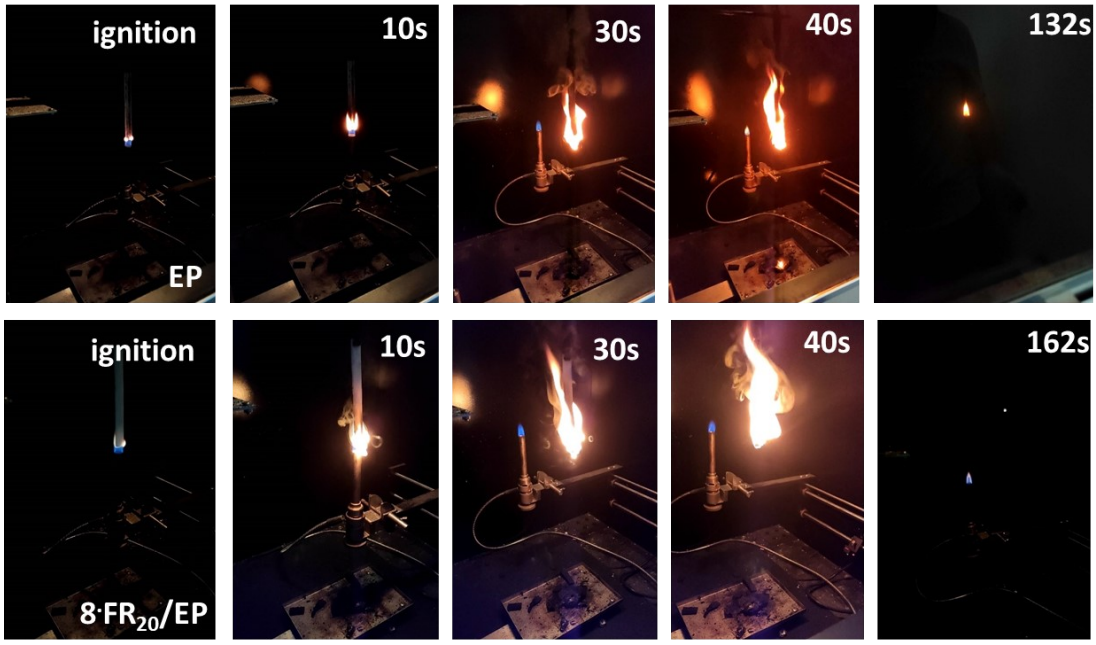

Figure S3. The combustion process of EP and 8·FR_{20}/EP during the UL-94 testing.

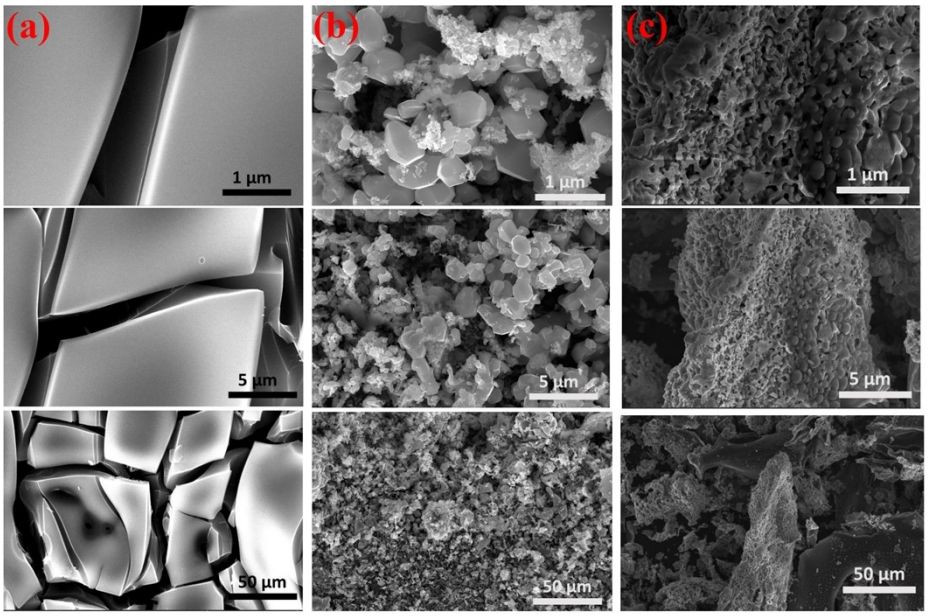

Figure S4. SEM images of char residue from (a) EP, (b) 8_{20}/EP, and (c) 8·FR_{20}/EP.

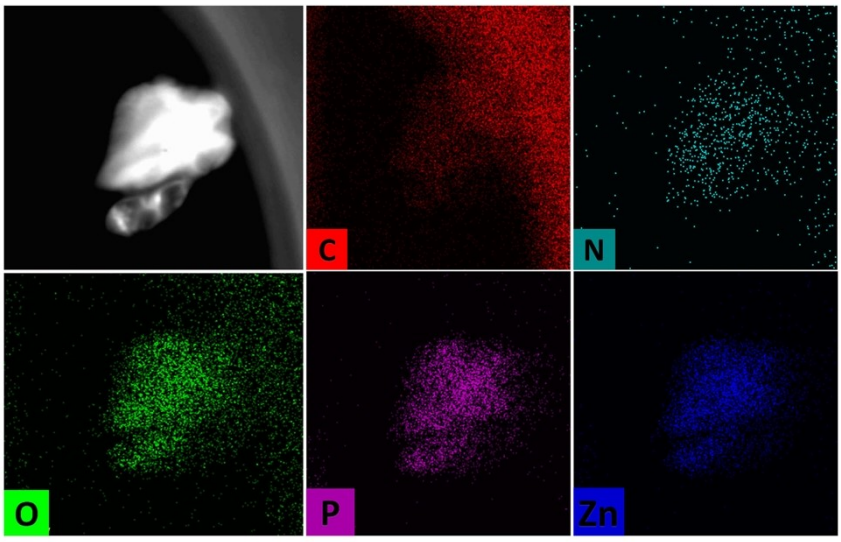

Figure S5. Elemental mapping of char residue from 8·FR_{20}/EP.

Table S1. Summary of Cone Calorimetry Results and Smoke Density Data for EP and Derived Composites.

Sample	pHRR (kW/m^2)	THR at 400 s (MJ/m^2)	TSP at 400 s (m^2)	COP_{max} (g/s)	CO_2P_{max} (g/s)	SPR_{max} (m^2/s)	Residue (%)	$D_{s,max}$
EP	1327	94	21	0.49	1.28	0.25	4.3	836.2
8_{20}/EP	750	84	19	0.16	0.61	0.21	17.9	629.4
8·FR_{20}/EP	723	76	16	0.18	0.53	0.18	16.1	589.5

Table S2 Dependence of dielectric constant and dielectric loss for previously reported EP nanocomposites.

Matrix composition	**Dielectric constant**	**Frequency (Hz)**	**Dielectric loss**	**Ref**
20 wt. % EP/HGM5	2.59	$10^2 – 10^6$	0.0145	1
EP/N-PPSQ composites	3.15	$10^2 – 10^6$	0.026	2
]DCPD/DPO-HQ-AE-0.9/EP	2.67	$10^5 – 10^9$	0.0045	3
EP/ Fe@POSS–COOH	3.51	$10^3–10^6$	not given	4
EP/MAP 1 wt. %	2.9	$10^3 – 10^7$	0.04	5
HCA-EP/MeHHPA	6.16	$10^3 – 10^7$	0.033	6
BAPT-EP/MHHPA	3.24-3.27	$10^6 – 10^8$	0.16	7
7 wt% EP/preFPBO in CE	2.48	$10^5 – 10^7$	0.01	8
CE-EP/prePBO	2.4	$10^5 – 10^6$	0.007	9
EP/ZIF@DMMP(20 wt. %)	**3.6~3.1** **3.0~2.7**	**$10^6 – 10^9$** **$10^8–10^9$**	**0.025-0.031** **0.028-0.032**	This work

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