

Polypropylene/Polyvinyl Alcohol/ Metal–Organic Framework Based Melt-Blown Electrospun Composite Membranes for Highly Efficient Filtration of PM_{2.5}

Table S1. Average fiber diameter of PP melt-blown membranes and PP/PVA/ZIF-8 membranes.

Membranes	PP/PVA/ZIF-8- 0%	PP/PVA/ZIF-8- 1.25%	PP/PVA/ZIF-8- 2.5%	PP/PVA/ZIF- 8-3.75%	PP/PVA/ZIF-8- 5%
average fiber diameter(μm)	0.318 $\pm$ 0.077	0.224 $\pm$ 0.051	0.213 $\pm$ 0.031	0.209 $\pm$ 0.058	0.212 $\pm$ 0.057

Table S2. Average filtration efficiency of PP melt-blown membranes and PP/PVA/ZIF-8 membranes when DEHS aerosol is 0.218-2.478 μm .

Membranes	PP	PP/PVA/Z IF-8-0%	PP/PVA/Z IF-8- 1.25%	PP/PVA/Z IF-8-2.5%	PP/PVA/Z IF-8- 3.75%	PP/PVA/Z IF-8-5%
average filtration efficiency (%)	21	93.8	95.6	96.5	95.9	97.1

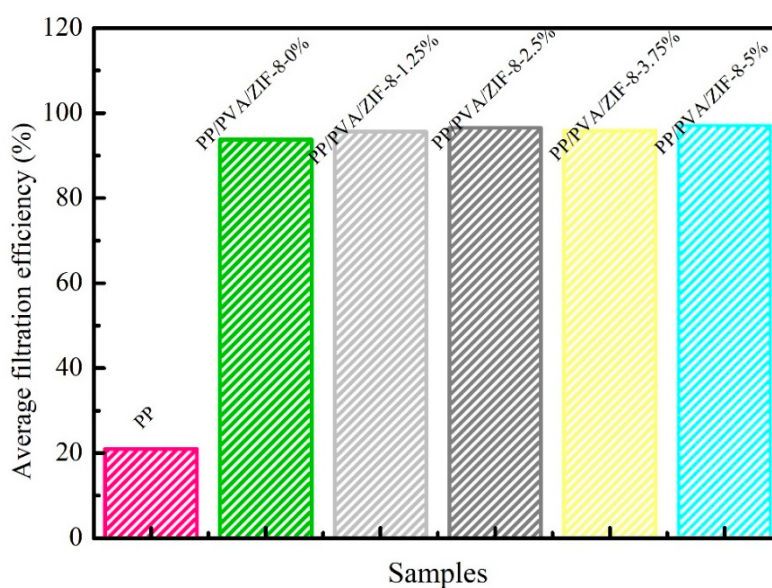


Figure S1. Average filtration efficiency of PP melt-blown membranes and PP/PVA/ZIF-8 melt-blown electrospun composite membranes when DEHS aerosol is 0.218-2.478 μm .

Table S3. Quality factor of membranes as related to the DEHS aerosol being 0.218-2.478 μm .

Membranes	PP	PP/PVA/Z IF-8-0%	PP/PVA/Z IF-8- 1.25%	PP/PVA/Z IF-8-2.5%	PP/PVA/Z IF-8- 3.75%	PP/PVA/Z IF-8-5%
average filtration efficiency (Pa ⁻¹)	0.009	0.032	0.02	0.099	0.025	0.038

Table S4. Comparison of comprehensive PM_{2.5} filtration performance of PP/PVA/ZIF-8-2.5% melt-blown electrospun composite membranes and other air filters.

Membranes	PM(μ m)	E _a (%)	Δ P _b (Pa)	Q _f _c (Pa-1)	Ref
PP/PVA/ZIF-8-2.5%	DEHS	96.5	34.00	0.099	This work
ZIF-8@CF	DEHS	98.36	134.00	0.0307	2018 ⁷
CFs@ZIF-8	DEHS	99.90	680.50	0.0102	2018 ⁶
Ag-MOFs@CF	DEHS	97.34	126.00	0.0288	2018 ⁷
MOF-199@CF	DEHS	98.28	131.00	0.0310	2018 ⁷
ZIF-8@CNF@CF	DEHS	93.75	148.00	0.0187	2019 ⁵
Ag-MOFs@CNF@CF	DEHS	91.25	122.00	0.0200	2019 ⁵
Ag-MOFs@CNF@ZIF-8	DEHS	94.30	157.81	0.0182	2019 ⁵

^a PM_{2.5}filtration efficiency. ^b Pressure drop. ^c Quality factor.

Table S5. Temperatures required by PP melt-blown membranes and PP/PVA/ZIF-8 melt-blown electrospun composite membranes as related to 90% and 50%.

Sample	Temperature at a mass fraction of 95% (°C)	Temperature at a mass fraction of 90% (°C)	Temperature at a mass fraction of 50%(°C)
PP/PVA	174.4	303.7	392.2
PP/PVA/ZIF-8-1.25 %	355.2	381.6	431.9
PP/PVA/ZIF-8-2.5 %	397.7	404.8	445.0
PP/PVA/ZIF-8-3.75 %	382.8	419.2	454.0
PP/PVA/ZIF-8- 5%	407.6	423.5	451.7

Table S6. Air permeability of PP melt-blown membranes and PP/PVA/ZIF-8 melt-blown electrospun composite membranesm .

Membranes	PP	PP/PVA/Z IF-8-0%	PP/PVA/Z IF-8- 1.25%	PP/PVA/Z IF-8-2.5%	PP/PVA/Z IF-8- 3.75%	PP/PVA/Z IF-8-5%
Air permeability (L/m ² /s)	240.62	99.60	66.81	137.92	72.44	88.71