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Supporting information for

Electrostatic Polyester Air Filter Composed of Conductive Nanowire and Photocatalytic Nanoparticle for Particulate Matter Removal and Formaldehyde Decomposition

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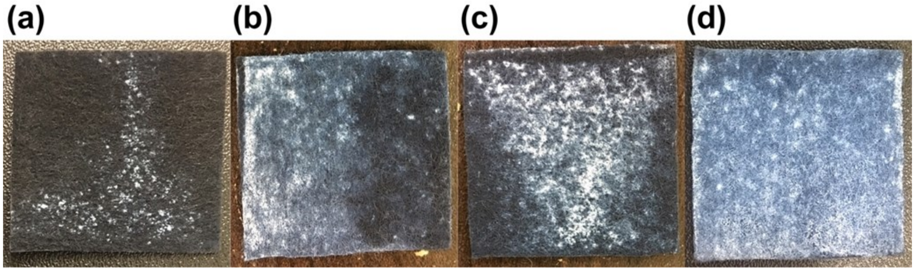

Figure S1. Optical images of the EPD deposited TiO_2 nanoparticles on the surface-treated polyester fabrics containing different number of LbL-assembled PDDA/PSS bilayers (fabric size: 50 mm × 50 mm): (a) 0 bilayer, (b) one bilayer, (c) two bilayers, and (d) three bilayers. It is found that increasing the number of PDDA/PSS bilayers on polyester fabric can provide sufficient electrostatic attraction for the subsequent TiO_2 nanoparticle deposition with uniform coverage.

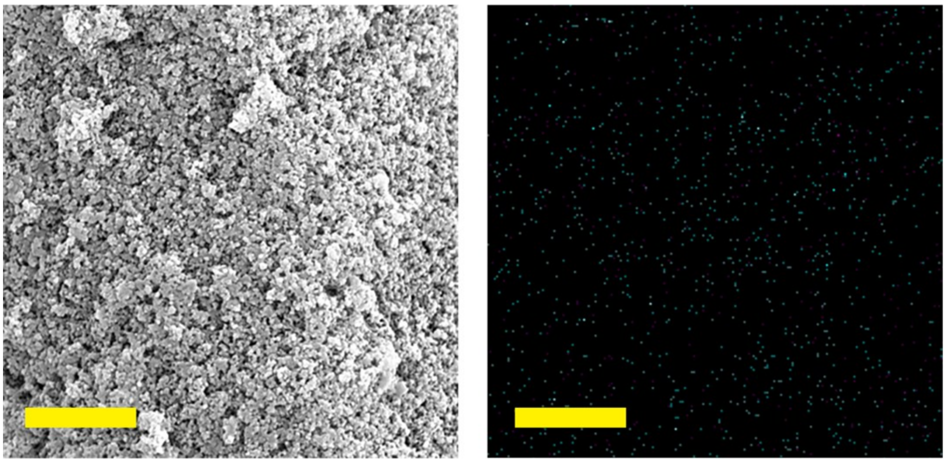

Figure S2. SEM image of the deposited photocatalyst TiO_2 nanoparticles on the PDDA/PSS-treated polyester fabrics and its corresponding energy-dispersive x-ray diffraction (EDX) mapping image of titanium element (scale bar: 2 μm).

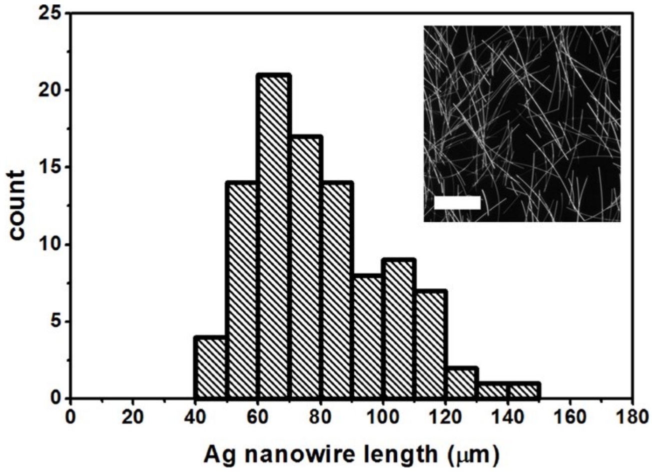

Figure S3. Histograms of length distribution of Ag nanowires. Inset: SEM image of as-prepared Ag nanowires with average length of ~70–80 μm and diameter of ~200 nm (scale bar: 50 μm).

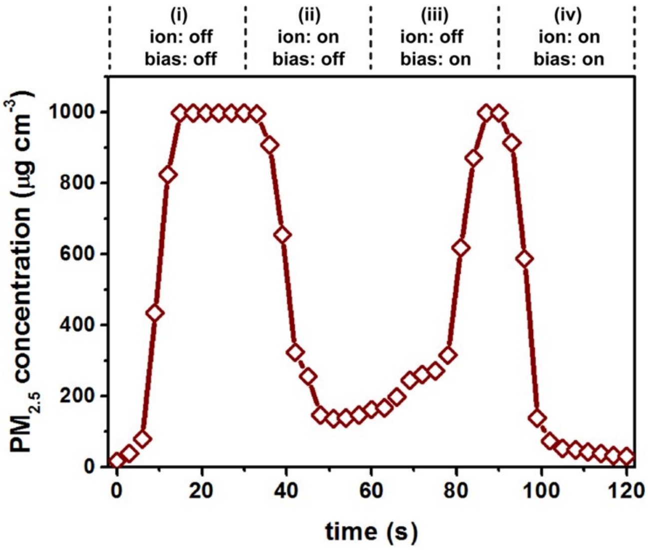

Figure S4. Transient evolution of $PM_{2.5}$ concentration under different assessment conditions: (i) ionizer and filter bias both off, (ii) only ionizer on (-10 V), (iii) only filter bias on (500 V), and (iv) ionizer and filter bias both on.

Table S1. Filtration performance comparison between this work and state-of-the-art fibrous air filters.

Material of air filter [ref.]	$\eta_{PM2.5}$ (%)	ΔP (Pa)	Q factor (Pa^{-1})	DHC ($g\ cm^{-2}$)	Reusability	airflow ($cm\ s^{-1}$)	voltage (V)
electrospun PAN nanofiber [S1]	98.1	206	0.019	–	×	–	
electronspun PI nanofiber [S2]	99.5	73	0.107	–	×	20	–
electrospun PTFE NP-PVDF nanofiber [S3]	99.97	57	0.14	–	×	5.3	–
electronspun Steiner geometrical SDBS-PVDF nano-fiber/net [S4]	99.98	67	0.182	–	×	32 ($L\ m^{-1}$)	–
bicomponent spunbond MgSt-PE/PP nanofiber [S5]	98.94	38	0.11	10.87	×	32 ($L\ m^{-1}$)	–
ZiF-8@Melamine foam [S6]	99.5	30	–	–	○ (H_2O)	20	–
3D ceramic mullite foam [S7]	96.7	35	–	–	○ (EtOH)	5.3	–
electrical Ag NW-nylon fabric [S8]	99.99	10	–	–	○ (EG)	–	10
electrical Al-polyester fabric [S9]	99.99 (30-400 nm)	4.9	2.17	12.5	–	10	10000
electrical sandwiched steel-PAN-steel fiber [S10]	98.41	82	0.053	8.43	–	21	2000
electrical Cu-PAN fiber [S11]	>97 (CO_2)	–	–	–	○ (DMF)		20000
triboelectric PTFE-nylon fabric [S12]	96.0	~180	~0.018	–	○ (H_2O)	6 ($L\ m^{-1}$)	–
commercial-A [S1]	99.58	809	0.0068	–	×	–	–
commercial-B [S2]	99.91	433	0.0162	–	×	20	–
electrical Ag NW/TiO$_2$ NP-polyester fabric (This work)	**99.0**	**11**	**0.418**	**50.81**	**○ (EG)**	**5**	**1000 V**

$\eta_{PM2.5}$: $PM_{2.5}$ removal efficiency
ΔP: pressure drop
Q factor: quality factor
DHC: dust holding capacity

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