Electronic Supplementary Material (ESI) for Nanoscale.

Supplementary information

One stone two birds: a sinter-resistant TiO_2 nanofiber-based unbroken mat enables PMs capture and *in situ* elimination

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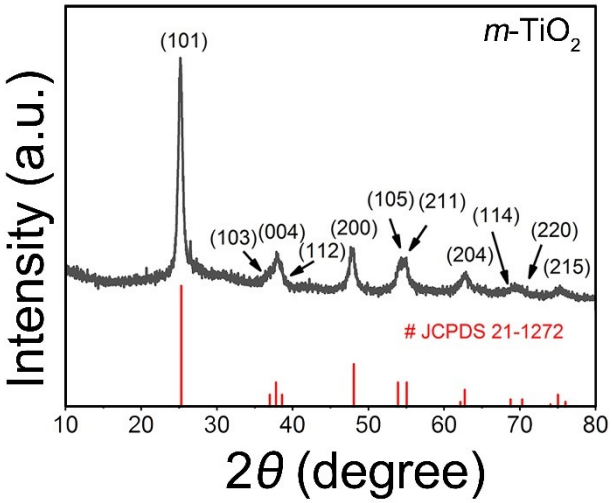

Fig. S1 XRD patterns of *m*-TiO_2 nanofibrous mats.

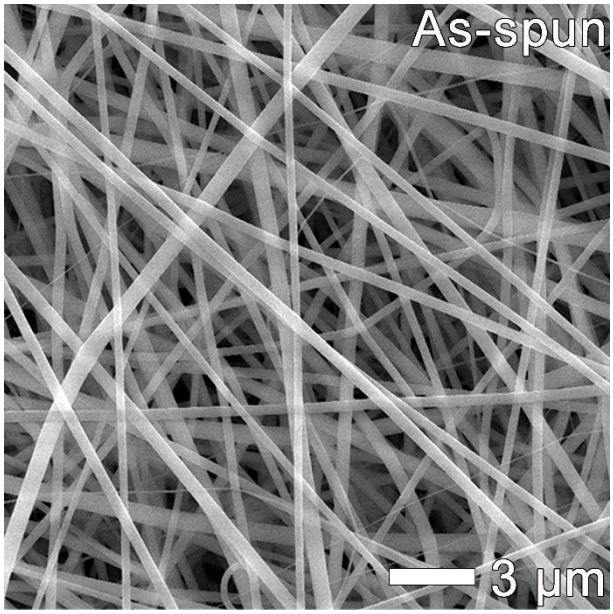

Fig. S2 SEM image of the as-spun composite mat.

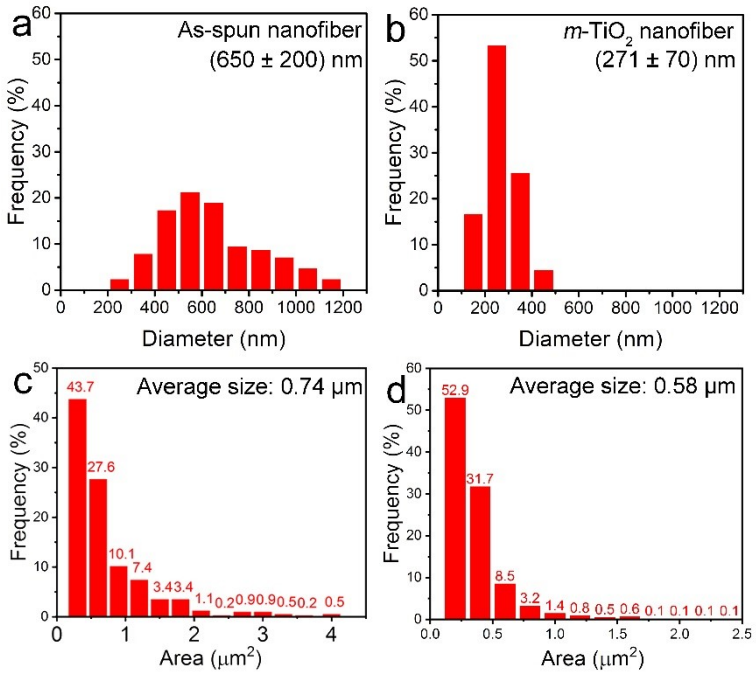

Fig. S3 (a, b) Diameter distribution and (c, d) area distribution of the as-spun composite mat in Fig. S2 and the *m*-TiO_2 mat in Fig. 1f.

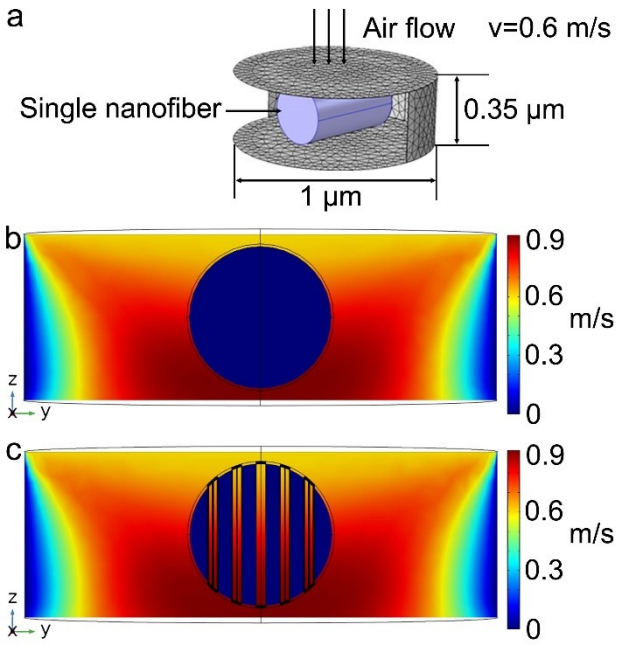

Fig. S4 (a) The model used in airflow simulation. (b) and (c) are the air-flowing rate distribution of single non-porous nanofiber and porous nanofiber, respectively.

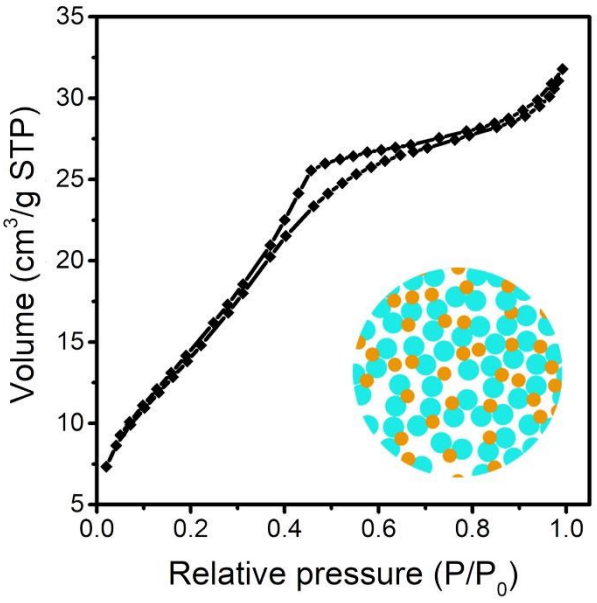

Fig. S5 The nitrogen adsorption-desorption isotherms of the *m*-TiO_2 nanofibers. The inset is the schematic diagram of intra-fiber pores.

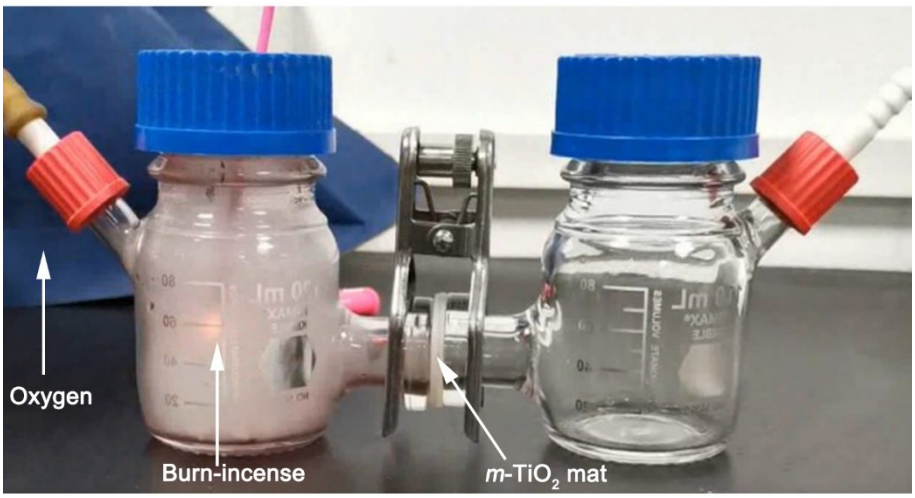

Fig. S6 Optical image of burn-incense filtration setup.

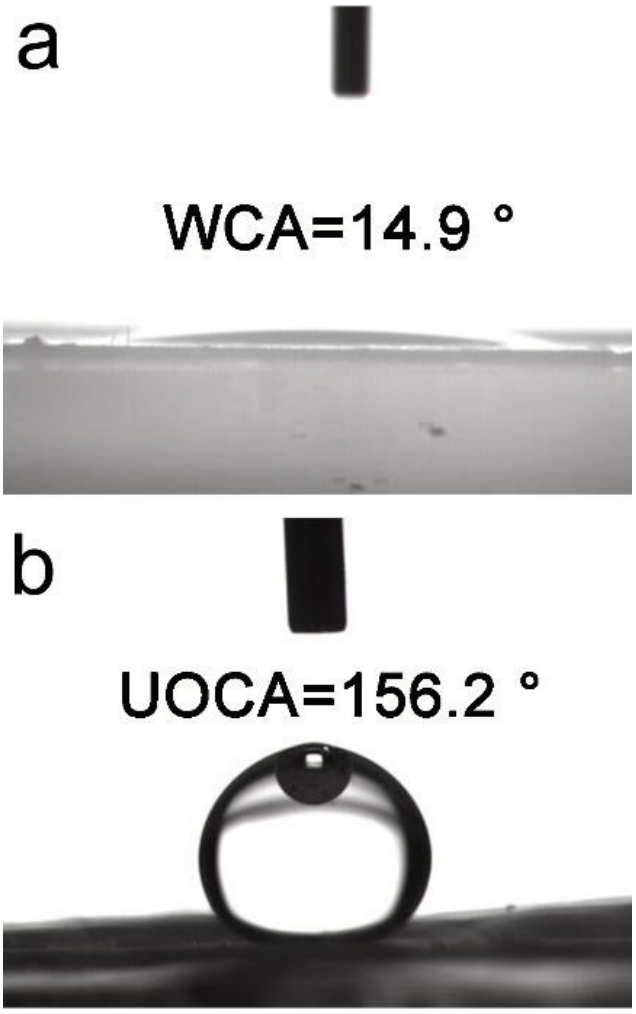

Fig. S7 (a) Water contact angle (WCA) and (b) underwater oil contact angle (UOCA) of the *m*-TiO_2 mat.

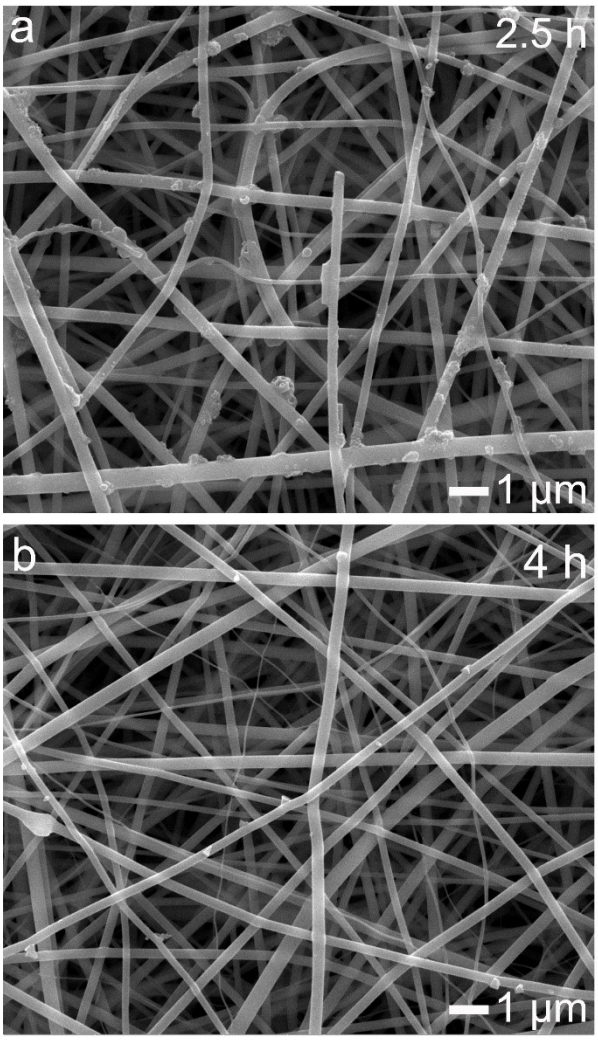

Fig. S8 SEM images of the *m*-TiO_2 mats with burned incense under sunlight irradiation for (a) 2.5 and (b) 4 h.

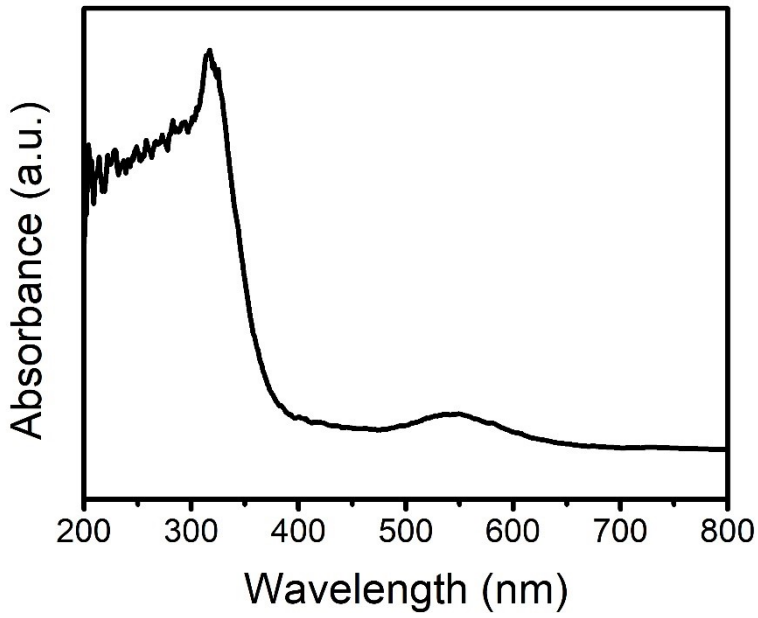

Fig. S9 UV–vis spectrum of the Au@*m*-TiO_2 mat.

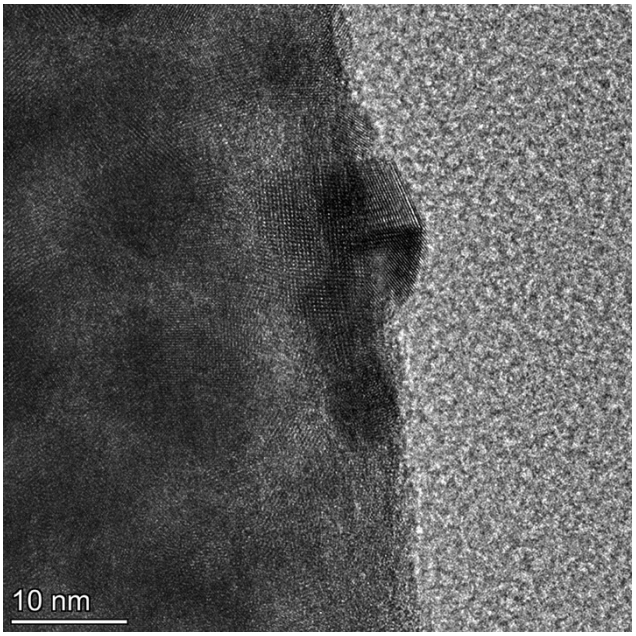

Fig. S10 The pristine uncolored HRTEM image of the Au@*m*-TiO_2 nanofiber in Fig. 4(d).

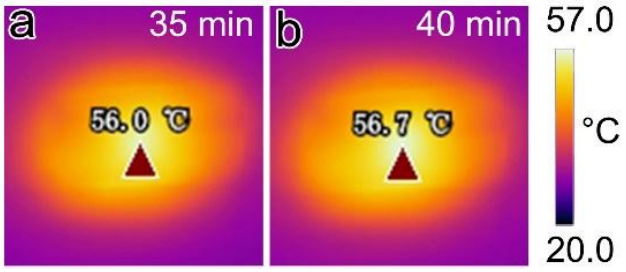

Fig. S11 Infrared image of the *m*-TiO_2 mat under one Sun irradiation for (a) 35, and (b) 40 min.

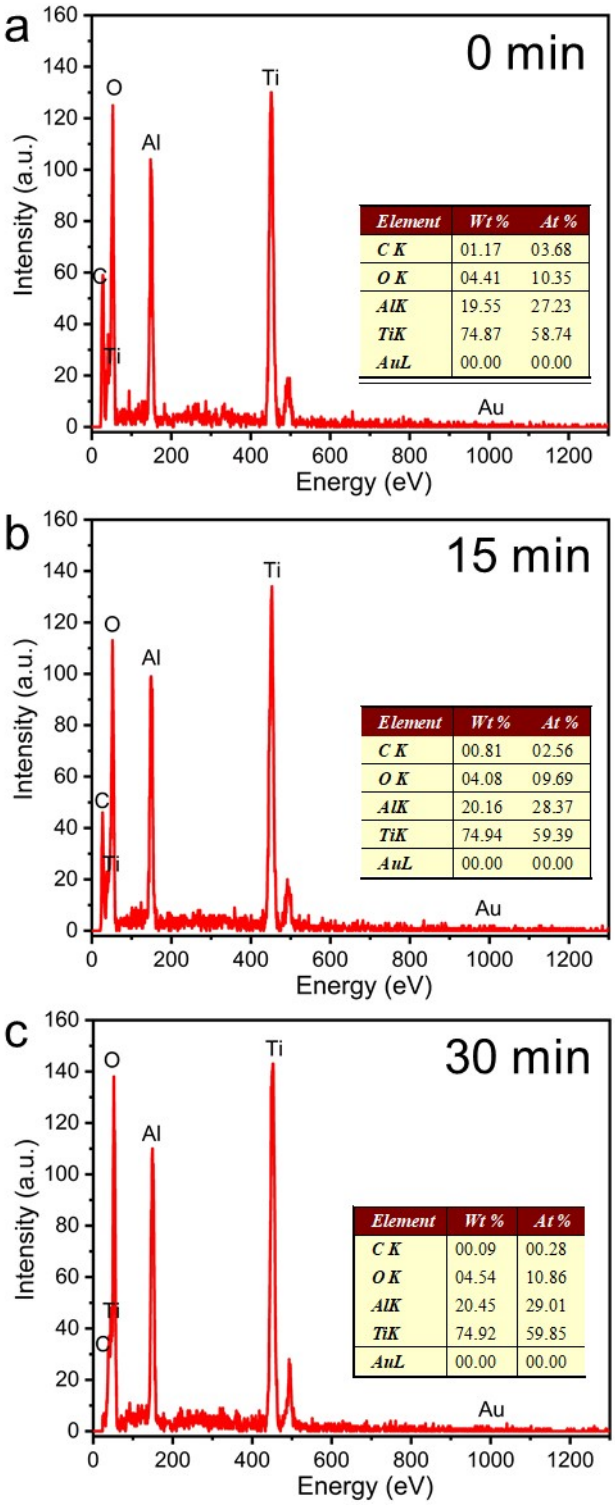

Fig. S12 The EDX spectra of cigarette-polluted Au@*m*-TiO_2 mat before (a) and after being sunlight irradiation-treated (2.2 Sun) for 15 (b) and 30 (c) min.

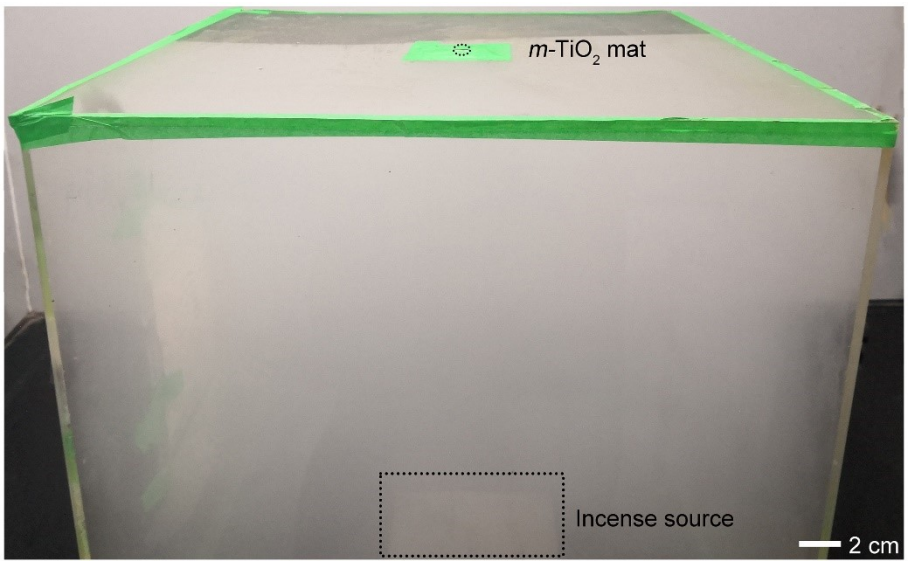

Fig. S13 The optical image of the filtration setup for the long-term test.

Movie. S1 The folding process of the *m*-TiO_2 mat.

Movie. S2 The recording of the *m*-TiO_2 mat upon heating on an alcohol lamp for 60 s.

Movie. S3 The recording of the *m*-TiO_2 mat upon heating on a butane blowtorch for 60 s.