## Supporting Information

## High Efficiency, Transparent, Reusable and Active PM2.5 Filters by Hierarchical Ag Nanowire Percolation Network

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**Figure S1.** Schematic of the spider-web structure for the TRAP filter. The transferred Ag nanowire meshes were hanging between nylon mesh as well as covered on the nylon mesh.



**Figure S2.** (a) A digital differential pressure gauge (DT-880A, Shenzhen Everbest Machinery Industry Co. Ltd.) was used measure the pressure drop across the TRAP filter in the measurement chamber. The measured pressure drop was approximately  $10.34 \pm 3.44$  Pa. (b) Air flow velocity was measured by an anemometer (TESTO 425, Testo Inc.) as 0.11 m/s across the TRAP filter in the measurement chamber. The red dotted circle indicates a location of the anemometer tip.



**Figure S3.** The cleaning effect for various polar solvents was demonstrated. Cleaning efficiency increased with the dipole moment of the solvents, known as ethanol: 1.69 D, DI water: 1.85 D and ethylene glycol: 2.36 D.



**Figure S4.** SEM images for the same area of TRAP filter (a-f) before and (a'-f') after cleaning process. All of AgNW networks robustly exist after cleaning process



**Figure S5.** SEM images of the TRAP filter surface (a) right after filtration (& before cleaning) and (b) after cleaning process. TRAP filter showed an excellent durability and reliability even after wash and it proves the on the reusability.



Figure S6. The PM size distribution from the incense.