Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting information

Superhydrophobic catalyst-wrapped fibrofelt with anti-moisture, anti-dusting and NH_3-SCR properties

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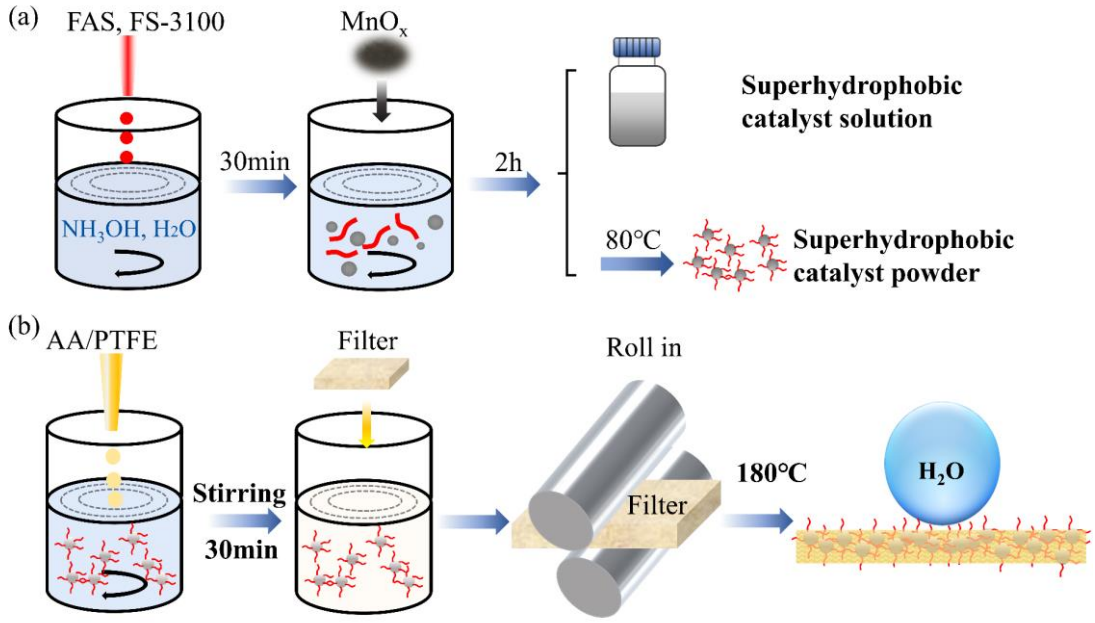

Figure. S1 Schematic diagram of preparation process. (a) Schematic diagram of superhydrophobic catalyst preparation process. (b) Schematic illustrations on the process of the synthesis for superhydrophobic filter materials with integrated denitration and dust removal function.

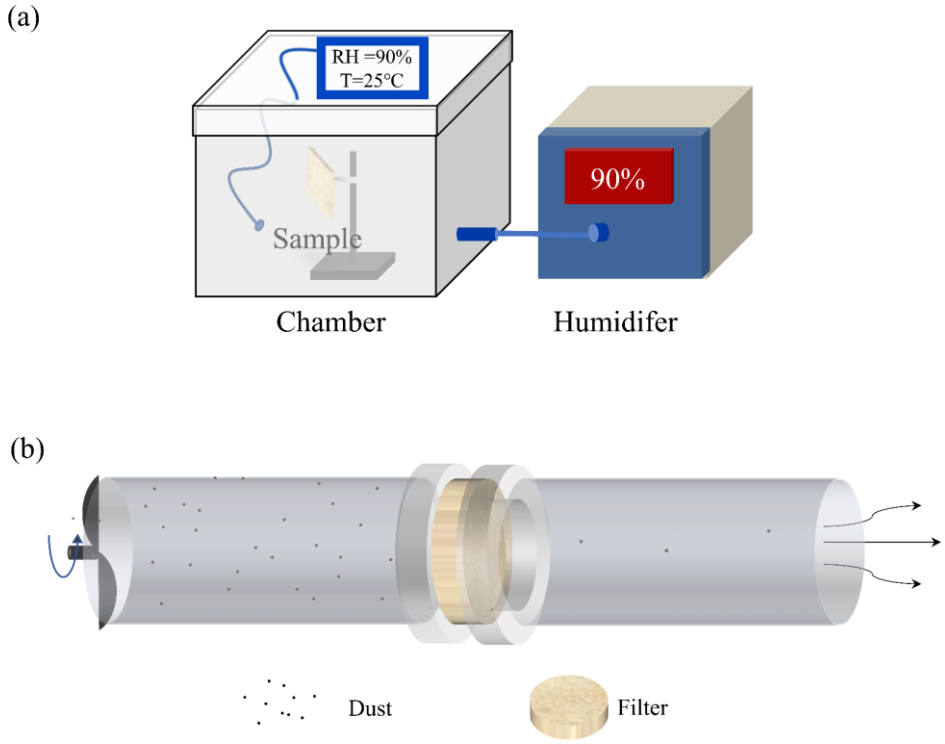

Figure.S2 Schematic diagram of (a) moisture-proof and (b) dust-proof device.

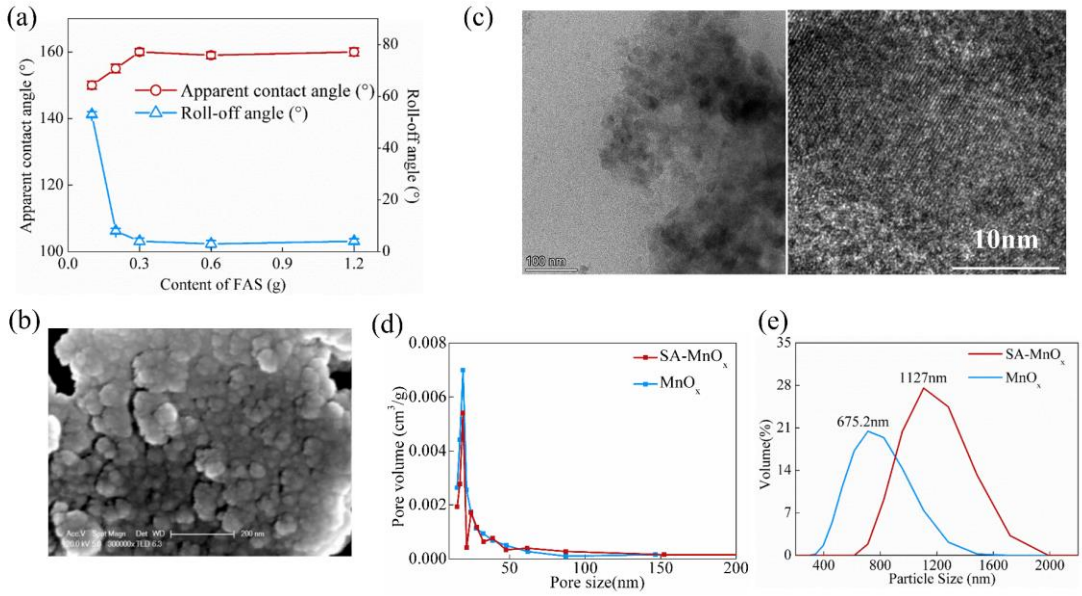

Figure.S3 (a) The static contact angle and rolling angle on the surface of MnO_x catalyst changed with the content of FAS. (b) SEM and (c) TEM image of MnO_x catalyst powder. (d) pore size distribution and (e) particle size of MnO_x catalyst before and after modification.

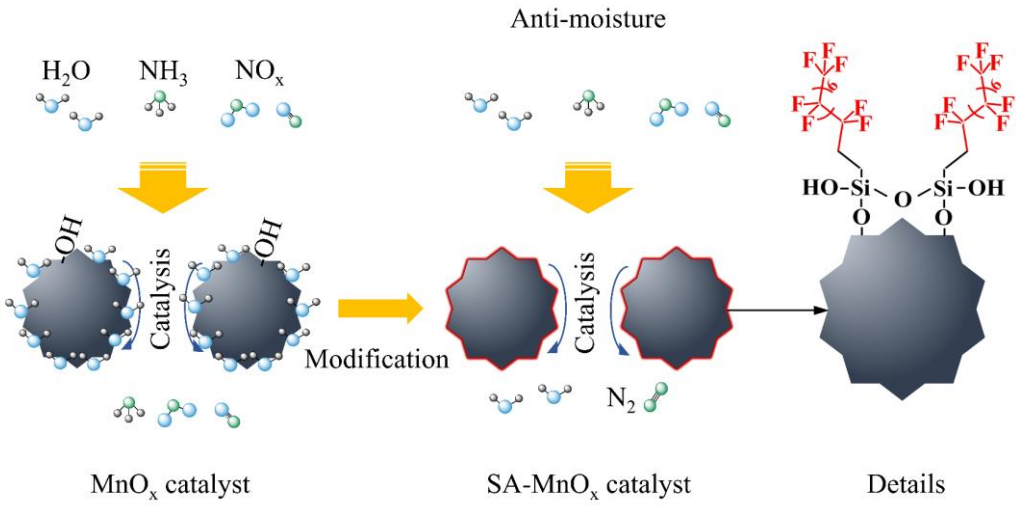

Figure.S4 Moisture proof mechanism of the modified catalyst.

Table. S1 Specific surface area and pore structure parameters of MnO_x and SA-MnO_x catalyst before and after modification

Catalyst	Specific surface area (m^2/g)	Pore volume(cm^3/g)	Pore size(nm)
MnO_x	61.851	0.165	19.111
SA-MnO_x	60.196	0.155	19.109

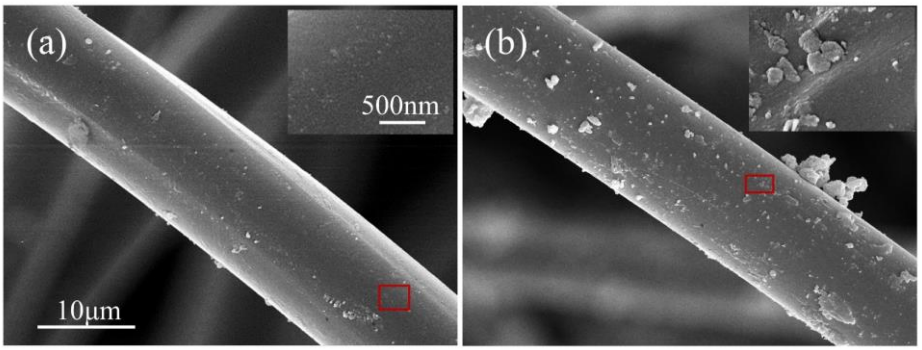

Figure.S5 SEM of filter (a) Original, (b) MnO_x@Filter (no resin).

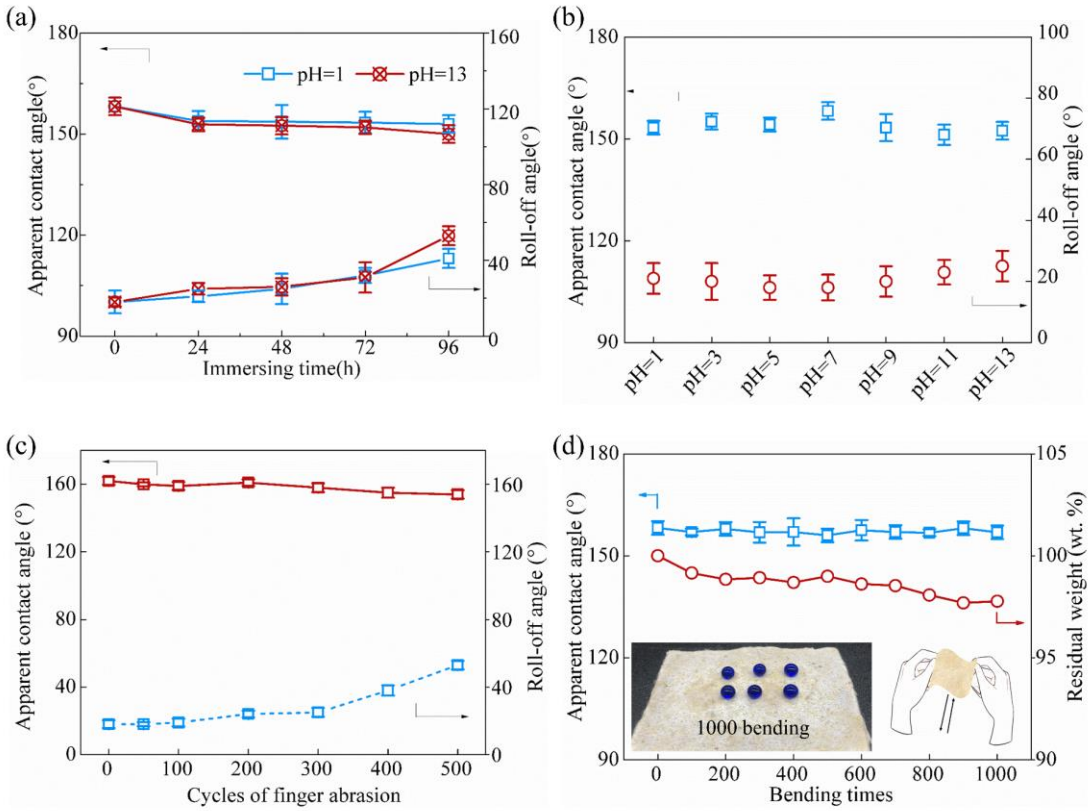

Figure. S6 (a) Wettabilty of SA-MnO_x @Filter after being immersed in solutions with pH = 1 or 13 for 96 hours. (b) Change in the contact angles and rolling angles for water in different corrosive solutions (pH=1 - 13) after immersing for 24h. (c) Wettabilty of SA-MnO_x @Filter after being wiped by finger for 500 cycles. (d) Residual weight of SA-MnO_x@Filter after 1000 times of bending.

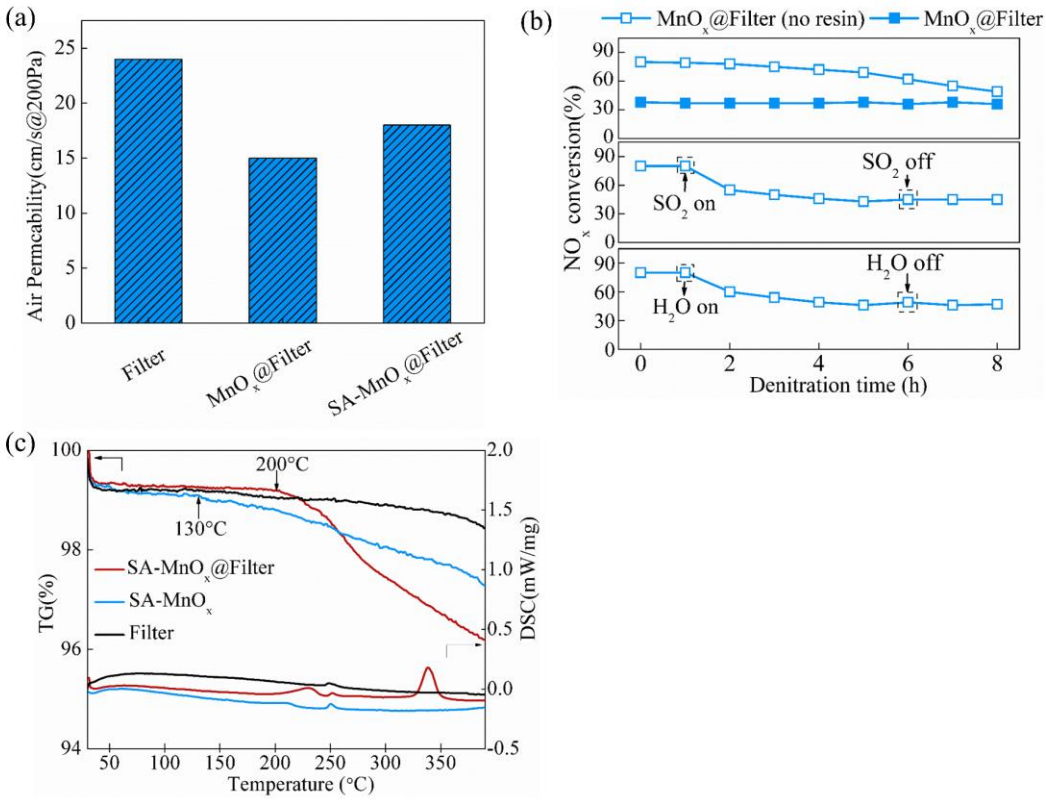

Figure.S7 (a) The air permeability of filter. (b) NO_x conversions of MnO_x@Filter (no resin) at 180℃ in the presence of SO_2 or H_2O (Reaction conditions: $[NO_x] = [NH_3]$ = 500 ppm, $[O_2]$ = 6 vol. %, 100 ppm SO_2 (when used), 10 vol. % H_2O (when used), total gas flow 700 ml•min^{-1} (corresponding to the filtration velocity of 1 m•min^{-1}), N_2 balance.). (c) TG and DSC curves of blank filter, SA-MnO_x catalyst and SA-MnO_x@Filter.