Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information

High-performance gas sensors based on a thiocyanate ion-doped organometal halide perovskite

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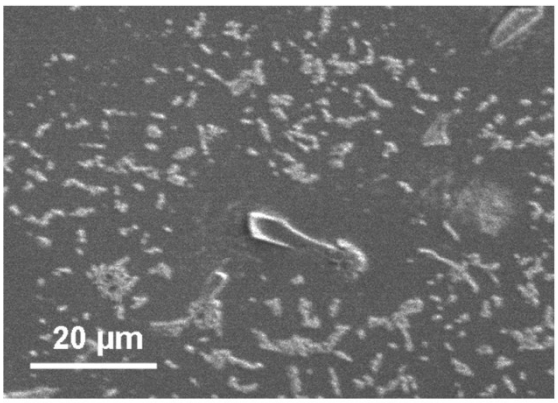

Fig. S1 SEM image of a $CH_3NH_3PbI_{3-x}(SCN)_x$ film prepared by using the DMSO solution of $Pb(SCN)_2$.

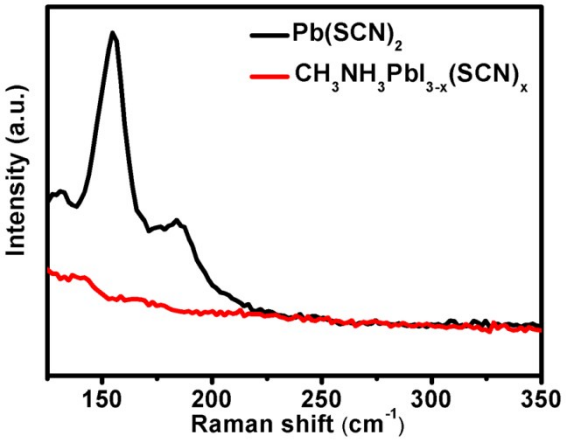

Fig. S2 Raman spectra of $Pb(SCN)_2$ and $CH_3NH_3PbI_{3-x}(SCN)_x$ films.

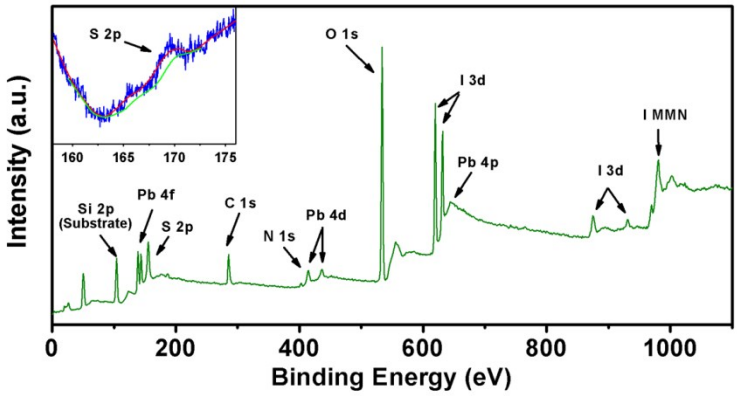

Fig. S3 XPS survey scan spectra of a $CH_3NH_3PbI_{3-x}(SCN)_x$ film; the inset shows the experimental data (blue) and fitted curve (red) of S 2p XPS spectrum.

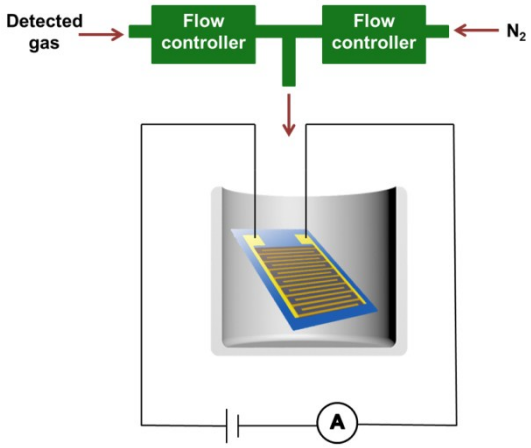

Fig. S4 Schematic diagram of the gas sensing set-up.

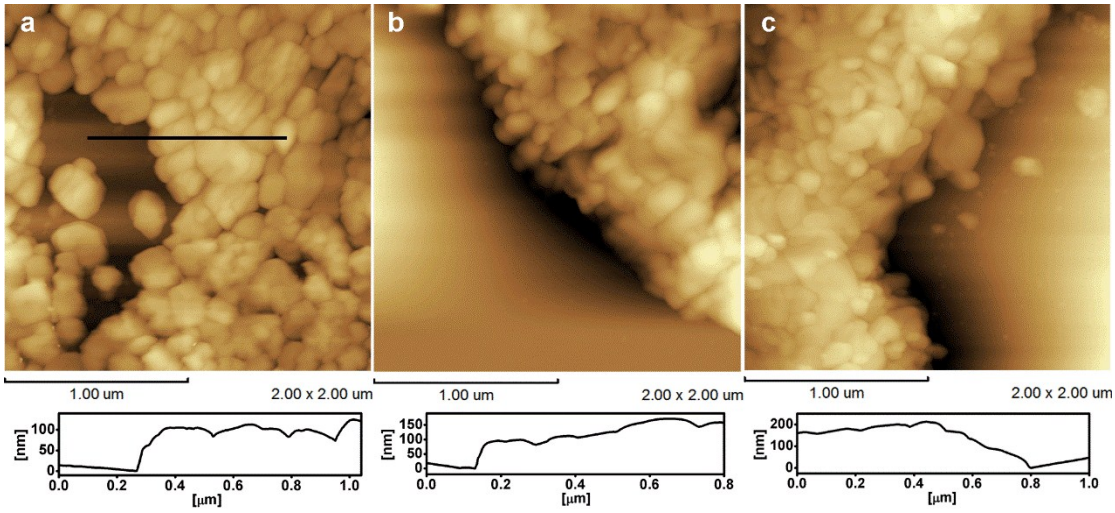

Fig. S5 AFM images with height profiles for the SCN-OHP sensing films prepared by using the DMF solutions of $Pb(SCN)_2$ with different concentrations: (a) 100, (b) 300, and (c) 500 mg mL^{-1}.

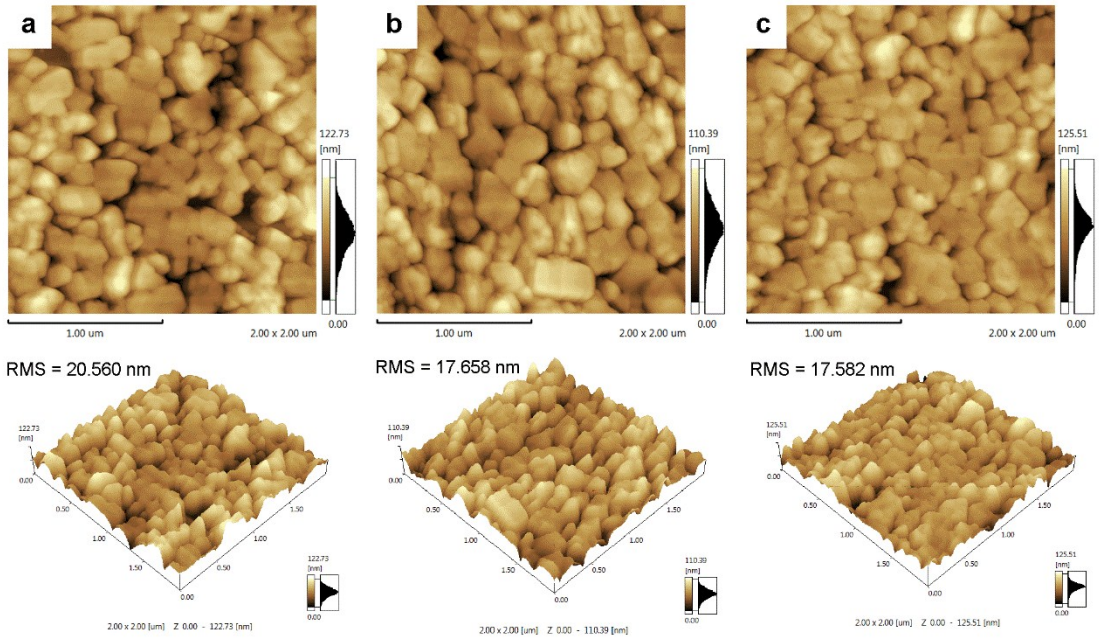

Fig. S6 AFM images of the SCN-OHP sensing films prepared by using the DMF solutions of $Pb(SCN)_2$ with different concentrations: (a) 100, (b) 300, and (c) 500 mg mL^{-1}.

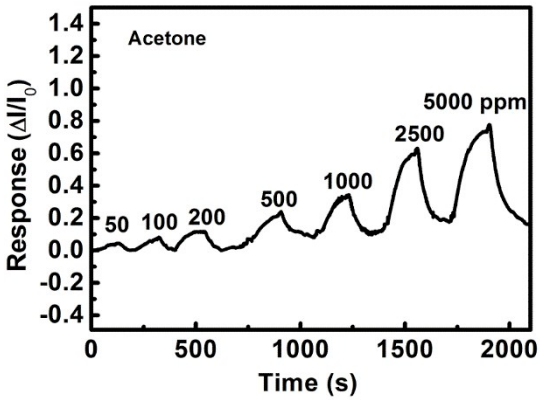

Fig. S7 Reponses of the $CH_3NH_3PbI_3$-based sensor upon exposing to acetone vapours with concentrations ranging from 50 to 5000 ppm.

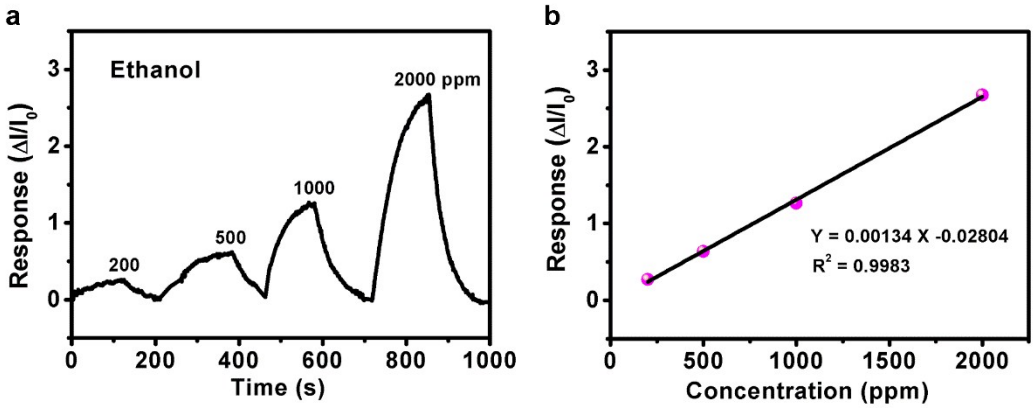

Fig. S8 (a) Reponses of $sensor_{120}$ upon exposing to ethanol vapors with concentrations ranging from 200 to 2000 ppm. (b) Response variation of the $sensor_{120}$ as a function of ethanol vapor concentration.

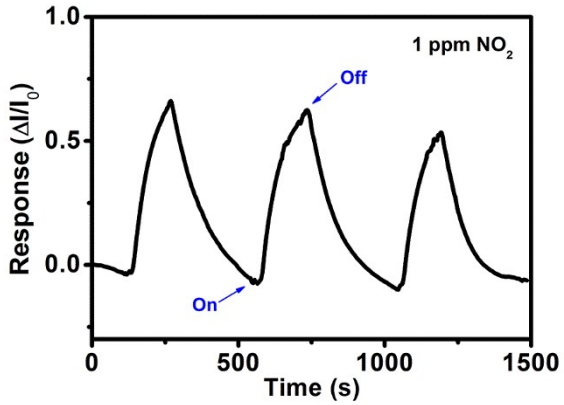

Fig. S9 Responses of $CH_3NH_3PbI_3$-based sensor upon the exposure to 1 ppm NO_2 during three successive cycles.

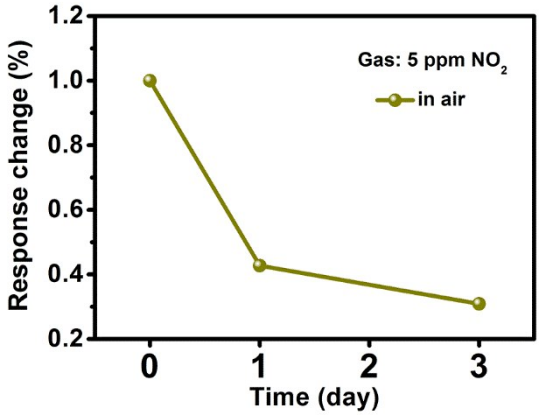

Fig. S10 Stability test of $CH_3NH_3PbI_3$-based sensor in the air with 30%–60% relative humidity at room temperature; target gas = 5 ppm NO_2.

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