Electronic supplementary Information

Volatile organic compound sensor based on methylammonium lead halide perovskite operating at room temperature

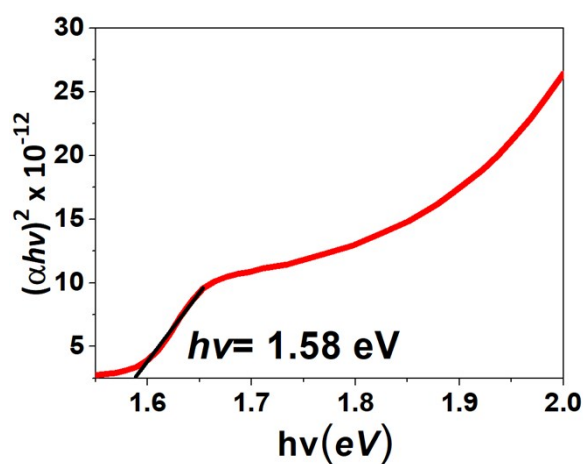Anafi Nur'aini [a] and Ilwhan Oh *[b]

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Fig. S1 $(\alpha h v)^2$ vs hv graph of 0.5 M MAPbI$_3$. Absorption coefficient (α)= absorbance/d. In this case, the thickness of film (d) of 0.5 M MAPbI$_3$ is 100 nm. Energy (hv) can be calculated by E= hc/λ, where h is planks constant (4.13×10^{-15} eV sec), c is velocity of light (3×10^8 m/s) and λ is wavelength.

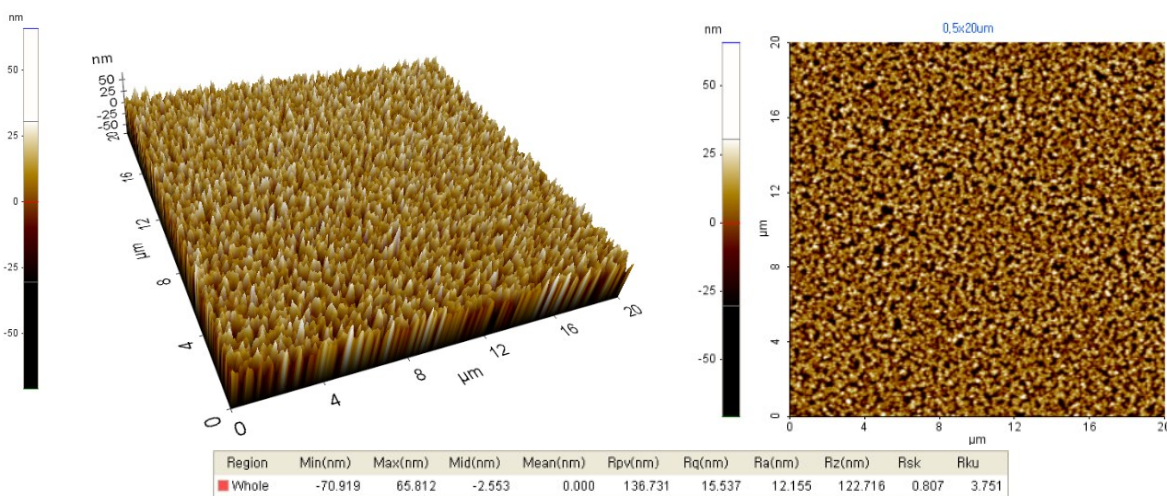| Region	Min(nm)	Max(nm)	Mid(nm)	Mean(nm)	Rpv(nm)	Rq(nm)	Ra(nm)	Rz(nm)	Rsk	Rku
Whole	-70.919	65.812	-2.553	0.000	136.731	15.537	12.155	122.716	0.807	3.751

Fig. S2 Atomic force measurement (AFM) images of 0.5 M MAPbI$_3$ film.
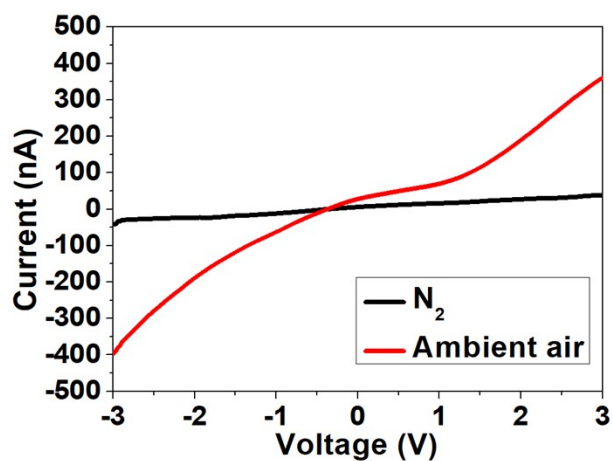
Fig. S3 I-V curve of MAPbI$_3$ during exposure towards nitrogen and ambient air.
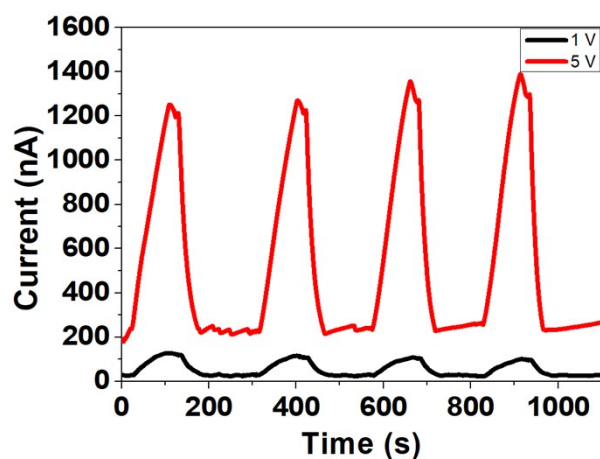

Fig S4 Current-time (I-t) graph of MAPbI$_3$ films under different applied bias (1 V and 5 V).
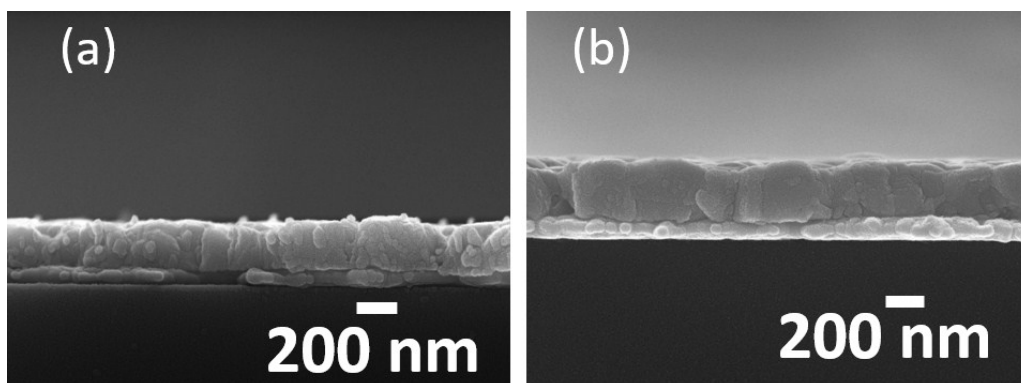

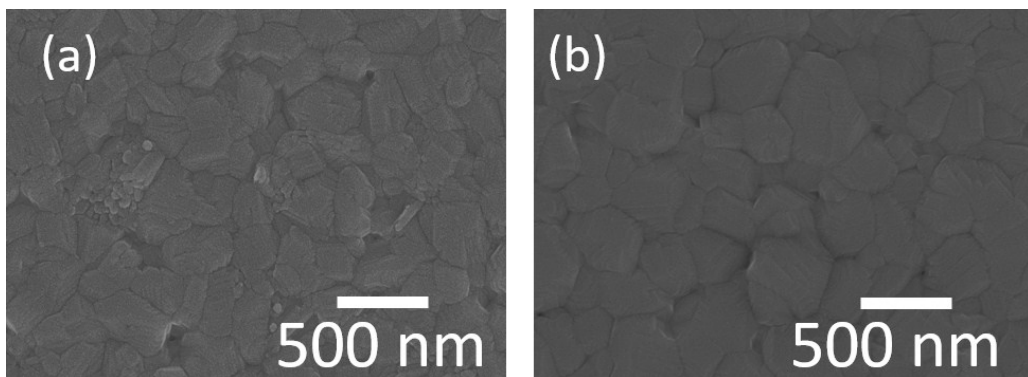**Fig. S5** Scanning electron microscope (SEM) images for cross section of (a) 1.0 M and (b) 1.5 M MAPbI$_3$ film.

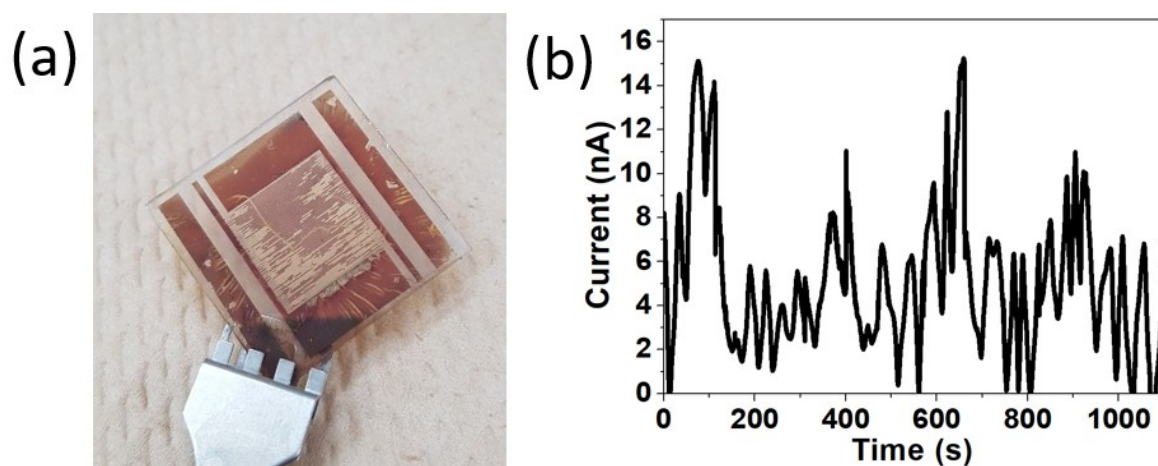**Fig. S6** Scanning electron microscope (SEM) images for top-view of (a) 1.0 M and (b) 1.5 M MAPbI$_3$ film.

Fig. S7 (a) Perovskite film on interdigitated electrode for 0.25 M MAPbI$_3$ (b) Current-time (I-t) graph of 0.25 M MAPbI$_3$ film towards ethanol (10,000 ppm).
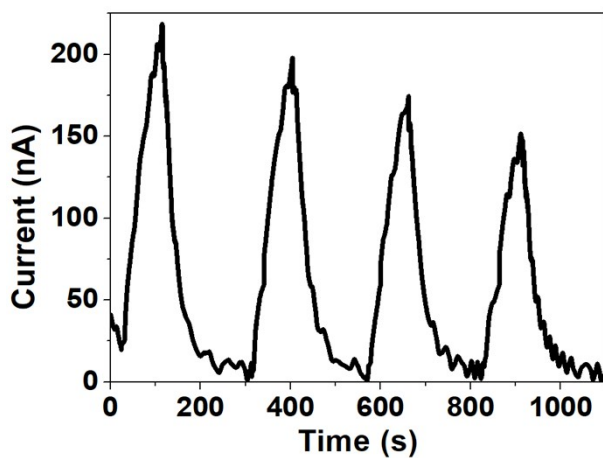

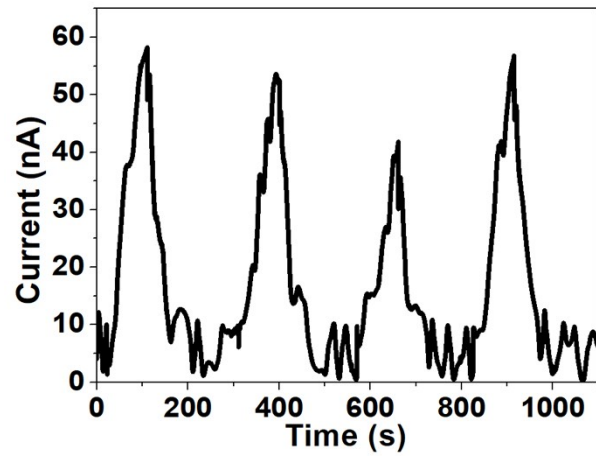**Fig S8** Current-time (I-t) graph of MAPbI$_3$ films towards nail polish remover vapour.

Fig S9 Current-time (I-t) graph of MAPbI$_3$ films towards soju vapour.