Electronic Supplementary Information (ESI) for

An Ultrasensitive and Reversible Fluorescence Sensor of Humidity Using Perovskite $CH_3NH_3PbBr_3$

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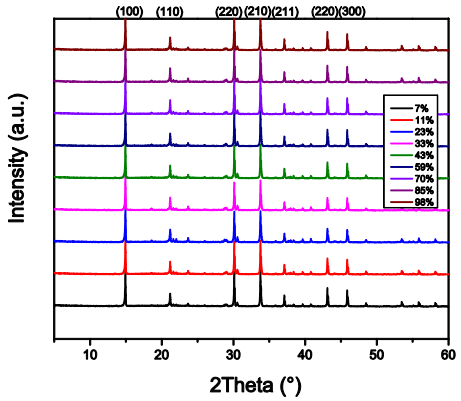

Figure S1A XRD patterns of the as-prepared $CH_3NH_3PbBr_3$ perovskite under different RH.

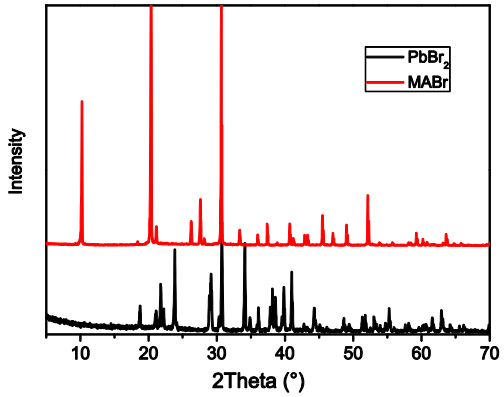

Figure S1B XRD patterns of the MABr and $PbBr_2$ cyrstals.

It should be noted that some very small peaks(labelled as *) in the XRD pattern may be associated with trace amounts of unreacted PbBr2 and CH3NH3Br, e.g. the 24° and 40° are from $PbBr_2$.

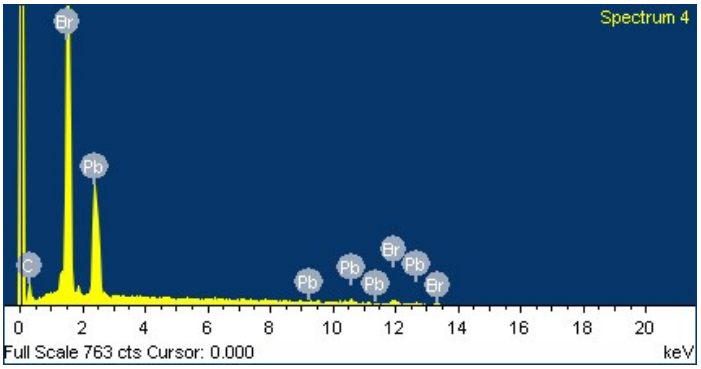

Figure S2 EDS measurement results of the $CH_3NH_3PbBr_3$ film

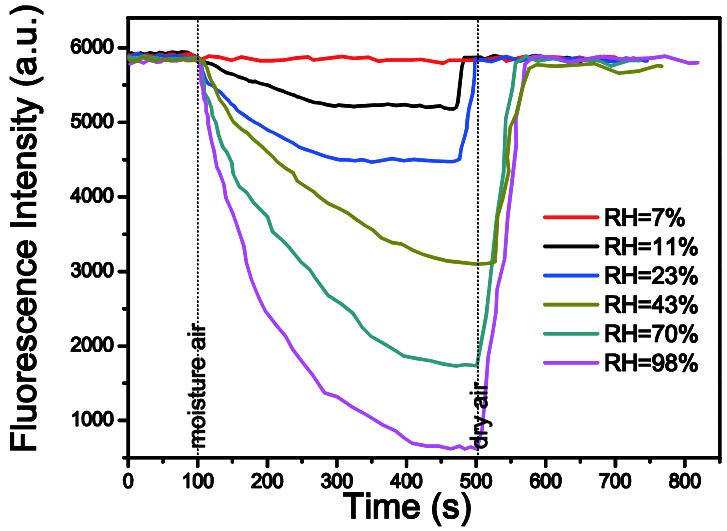

Figure S3 The dynamic fluorescence measured under different relative humidity at room temperature.

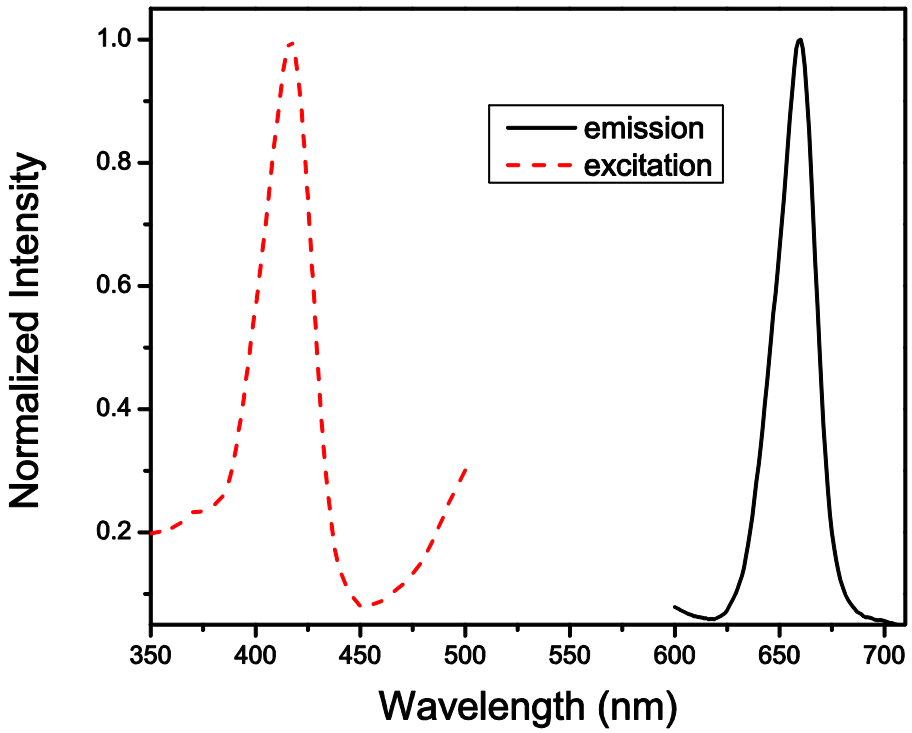

Figure S4 The emission spectra(black solid line) and excitation spectra (red dashed line) of the TFPP.

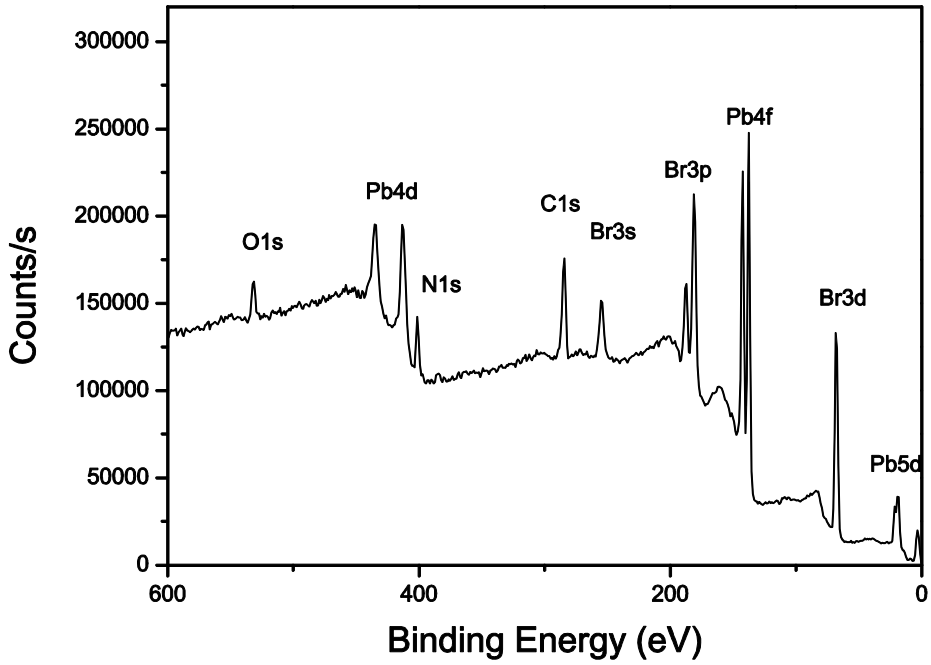

Figure S5 XPS survey spectra of a stored sensor sample exposed to humidity.