Supporting materials

Enhanced gas sensing performance of perovskite $YFe_{1-x}Mn_xO_3$ by doping manganese ions

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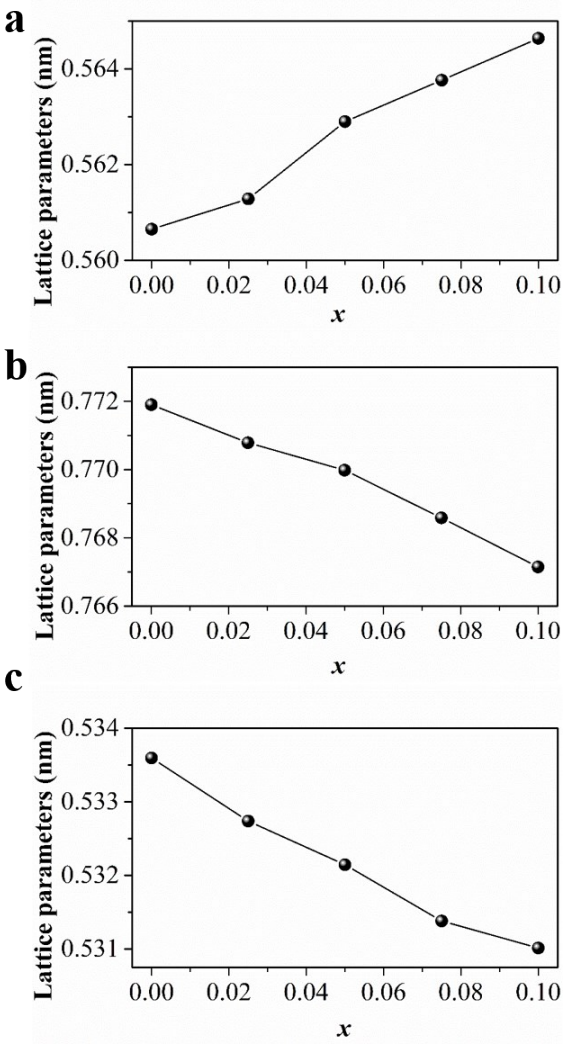

Fig. S1. Lattice parameters (a) *a*, (b) *b*, (c) *c*, of $YFe_{1-x}Mn_xO_3$ materials as a function of *x* in $YFe_{1-x}Mn_xO_3$.

Fig. S2. Original SEM image selected for the EDS mapping.

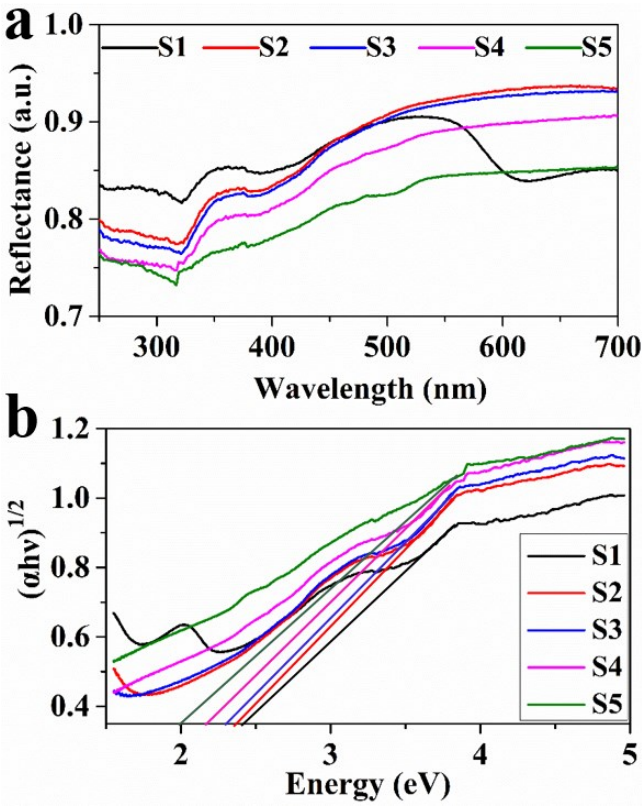

Fig. S3. (a) UV-vis diffuse reflectance spectra (DRS), (b) the plot of transformed Kubelka-Munk function versus the energy of light.

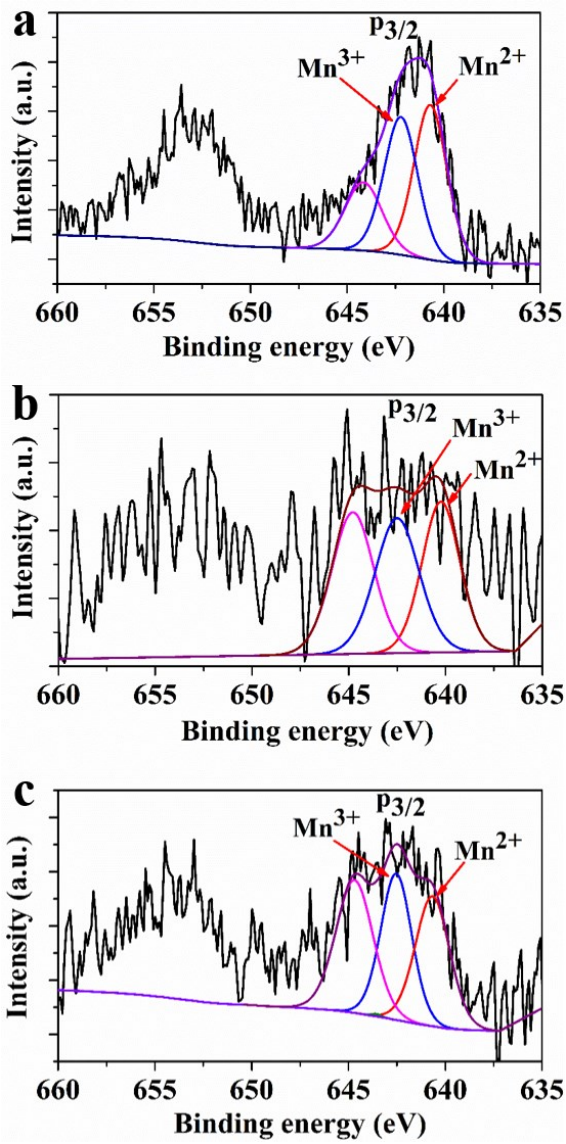

Fig. S4. Mn2p and its Gaussian fitting for (a) $YFe_{0.975}Mn_{0.025}O_3$ (S2), (b) $YFe_{0.925}Mn_{0.075}O_3$ (S4), (c) $YFe_{0.9}Mn_{0.1}O_3$ (S5).

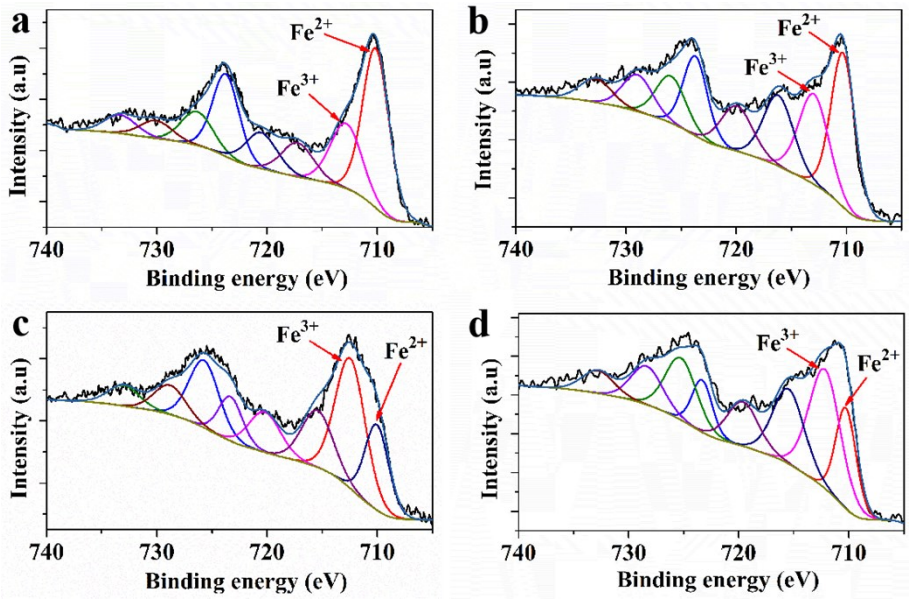

Fig. S5. Fe2p and its Gaussian fitting for (a) $YFeO_3$ (S1), (b) $YFe_{0.975}Mn_{0.025}O_3$ (S2), (c) $YFe_{0.925}Mn_{0.075}O_3$ (S4), (d) $YFe_{0.9}Mn_{0.1}O_3$ (S5).

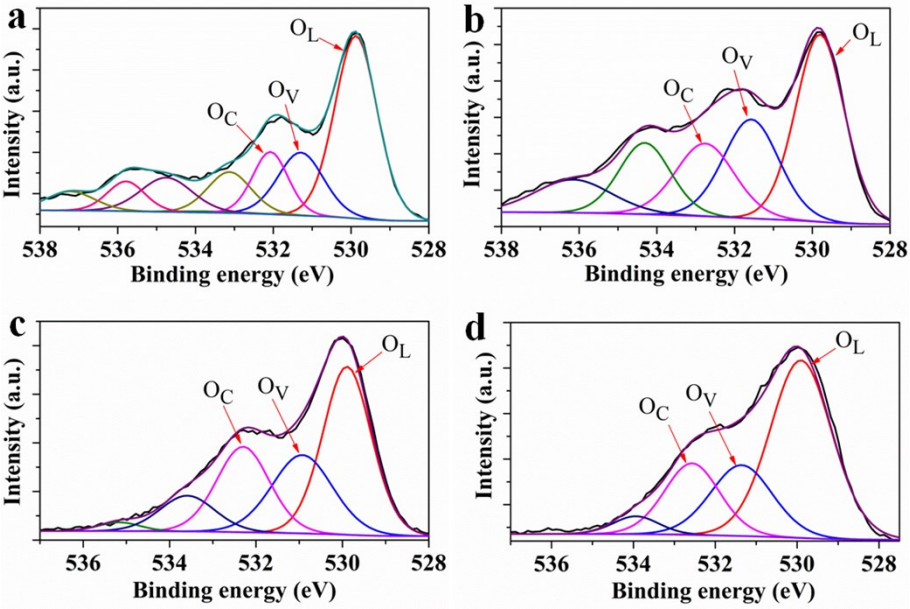

Fig. S6. O1s peaks together with Gaussian fitting for (a) $YFeO_3$ (S1), (b) $YFe_{0.975}Mn_{0.025}O_3$ (S2), (c) $YFe_{0.925}Mn_{0.075}O_3$ (S4), (d) $YFe_{0.9}Mn_{0.1}O_3$ (S5).

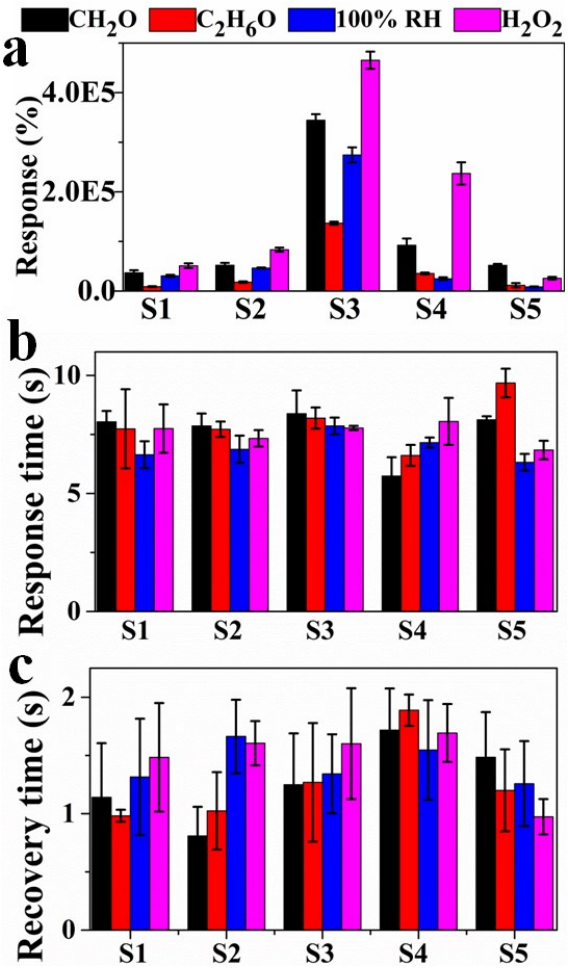

Fig. S7. (a) the average response, (b) response time (c) recovery time of five sensors based on $YFe_{1-x}Mn_xO_3$ to 1000 ppm of CH_2O, C_2H_6O and H_2O_2 vapor and 100% RH.