

Electronic Supporting Information

Highly Selective and Fast-Response Photoluminescence Humidity Sensor Based on F⁻ Decorated NH₂-MIL-53(Al) Nanorods

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Fig. S1 Photographs of the home-made sensing cell with different thickness of the films (left) and photograph of the optical path device (right).

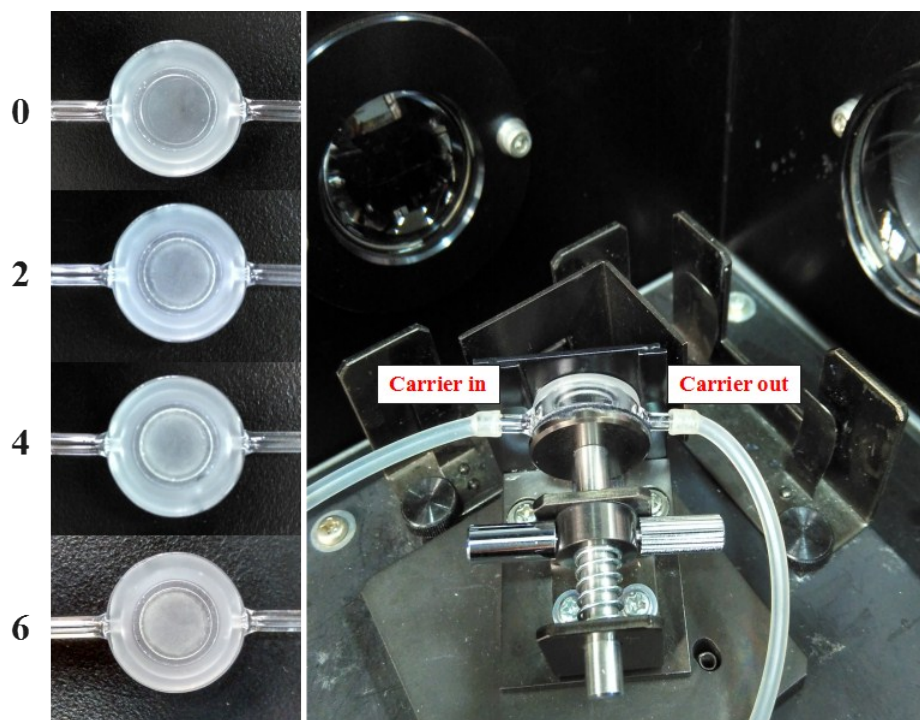


Fig. S2 SEM images of $\text{NH}_2\text{-MIL-53(Al)}$ synthesized with (A) 1.4 mmol NaF and (B) 1.4 mmol HCl.

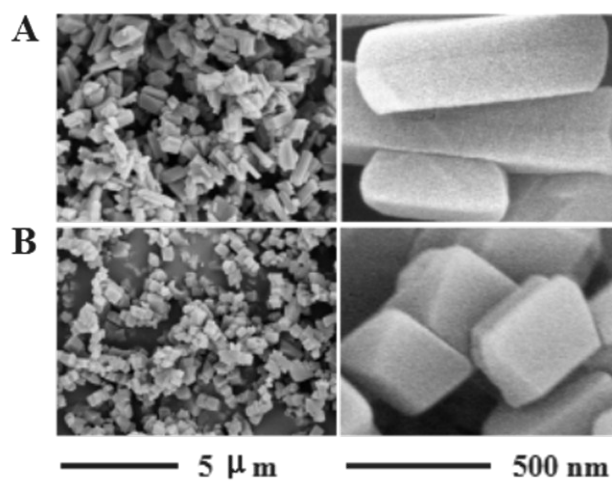


Fig. S3 (A) XPS spectra of NH₂-MIL-53(Al) nanoparticles. (B) High-resolution XPS spectra of Al 2p.

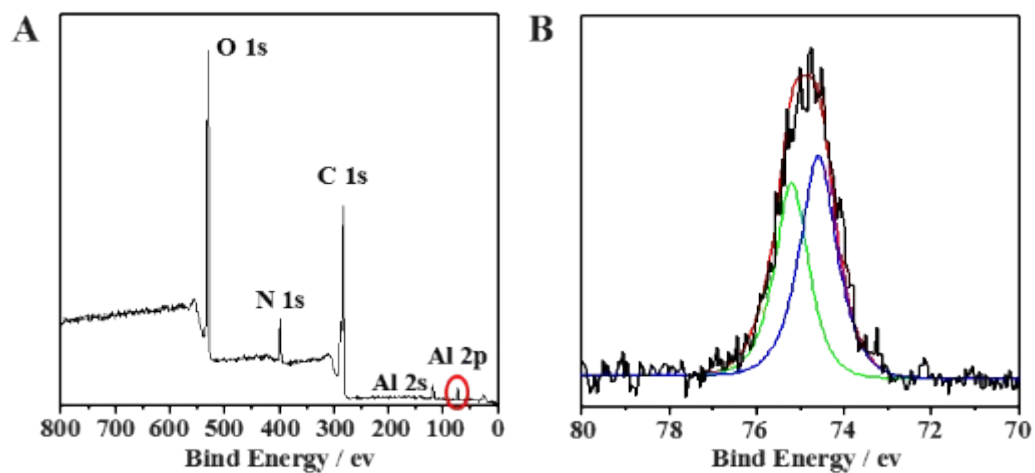


Fig. S4 The sensor based on NH₂-MIL-53(Al) nanorods layer response towards 40 $\mu\text{g mL}^{-1}$ water at different flow rate.

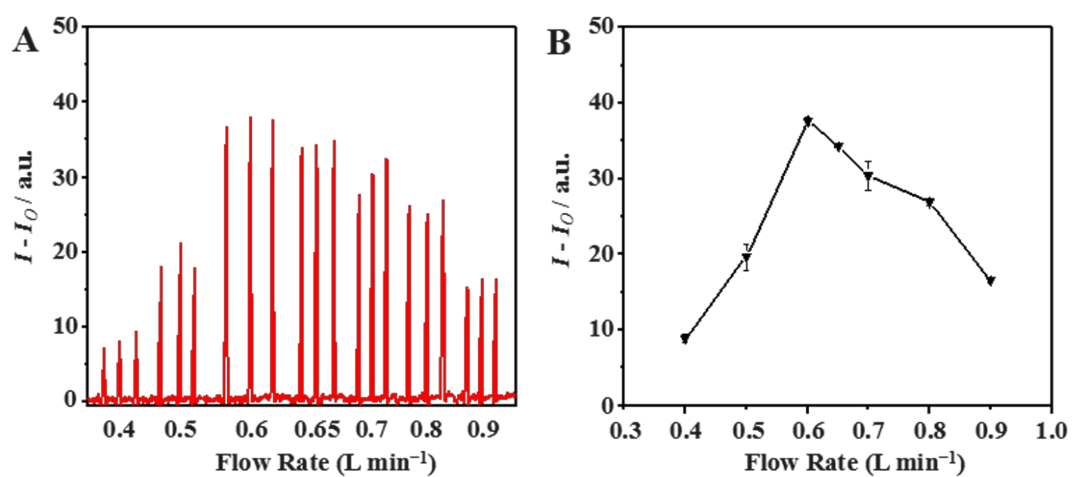


Fig. S5 Fluorescence spectra of $\text{NH}_2\text{-MIL-53(Al)}$ nanorods, $\text{NH}_2\text{-MIL-53(Al)}$ nanoparticles and $\text{NH}_2\text{-H}_2\text{BDC}$.

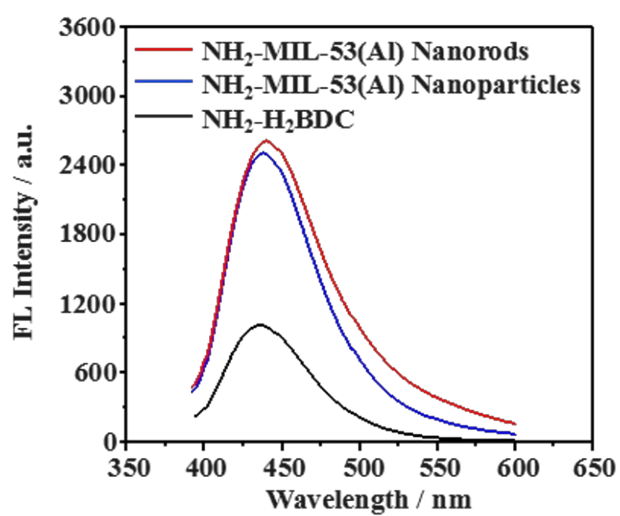


Fig. S6 Fluorescence emission spectra of $\text{NH}_2\text{-MIL-53(Al)}$ nanorods before and after reaction.

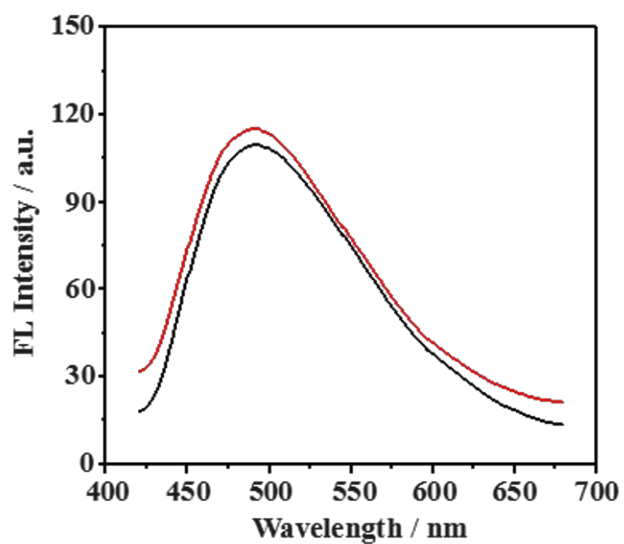


Fig. S7 The effect of O₂ on the fluorescence intensity of NH₂-MIL-53(Al) nanorods.

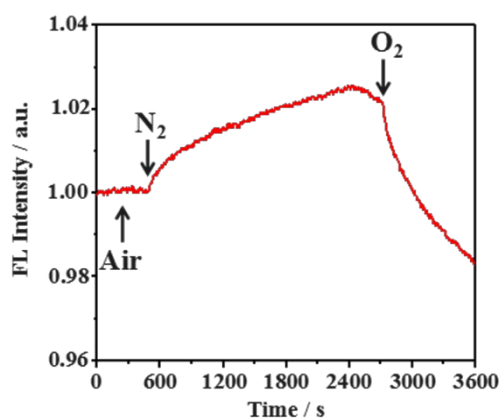


Fig. S8 The effect of N₂ on the fluorescence intensity of NH₂-MIL-53(Al) nanorods.

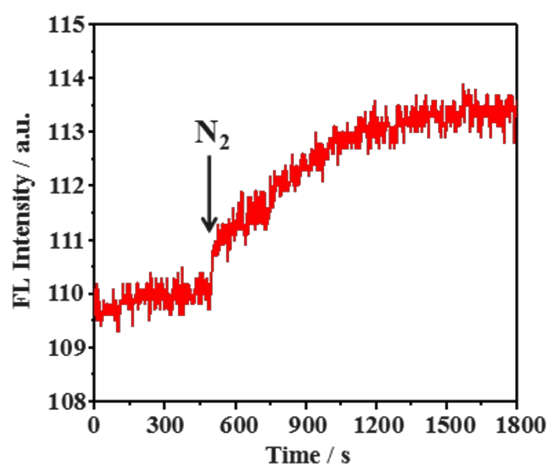


Fig. S9 The PL lifetime of NH₂-MIL-53(Al) nanorods before and after the reaction with water vapor.

