Supporting Information

A high-performance H_2 gas sensor based on PtO_x and PdO_y co-decorating WO_3 film

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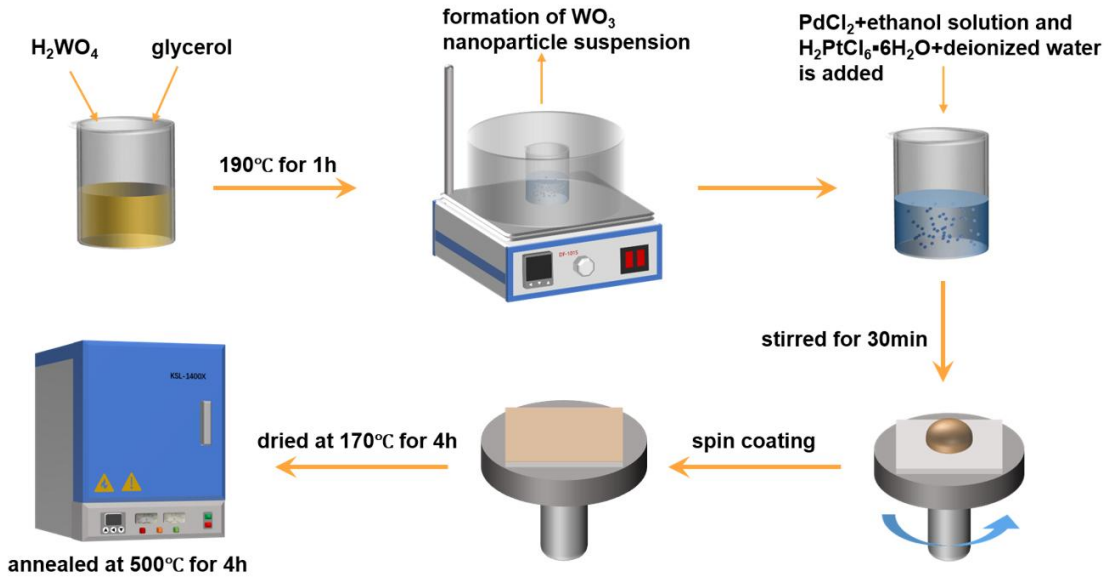

Fig.S1: Schematic diagram of the synthesis of the sensing film.

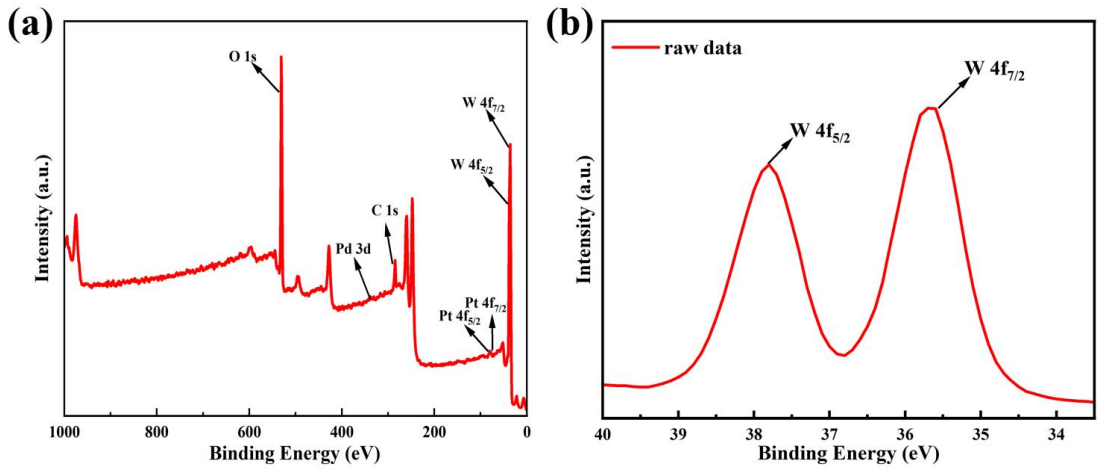

Fig.S2: (a) The survey XPS spectrum of the sensing film. (b) The core level spectra of W element.

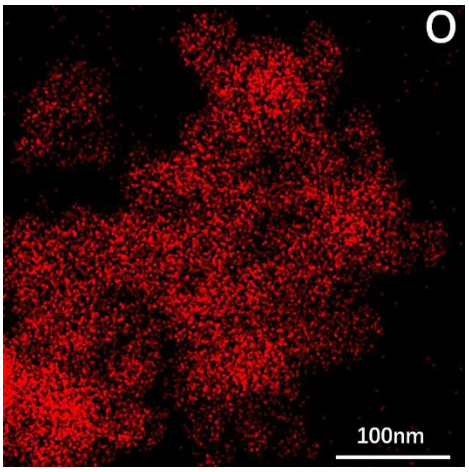

Fig.S3: The EDS mapping result of the O element for the sensing film.

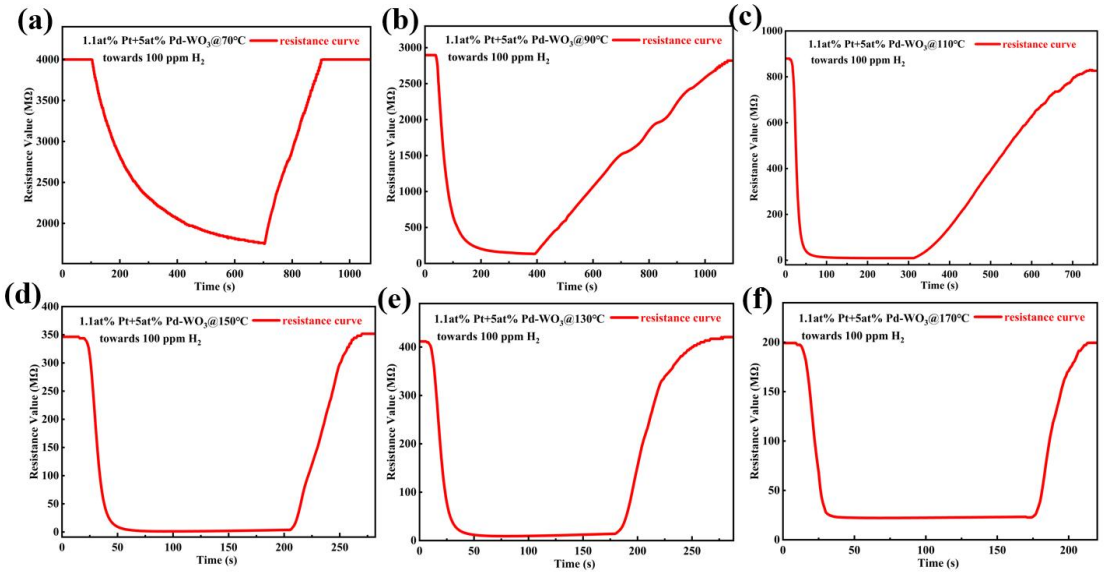

Fig.S4: (a)-(f) The real-time resistance variation of the sensor based on 1.1 at% Pt and 5 at% Pd decorating WO_3 film towards 100 ppm H_2, tested at 70, 90, 110, 130, 150 and 170 ℃, respectively.

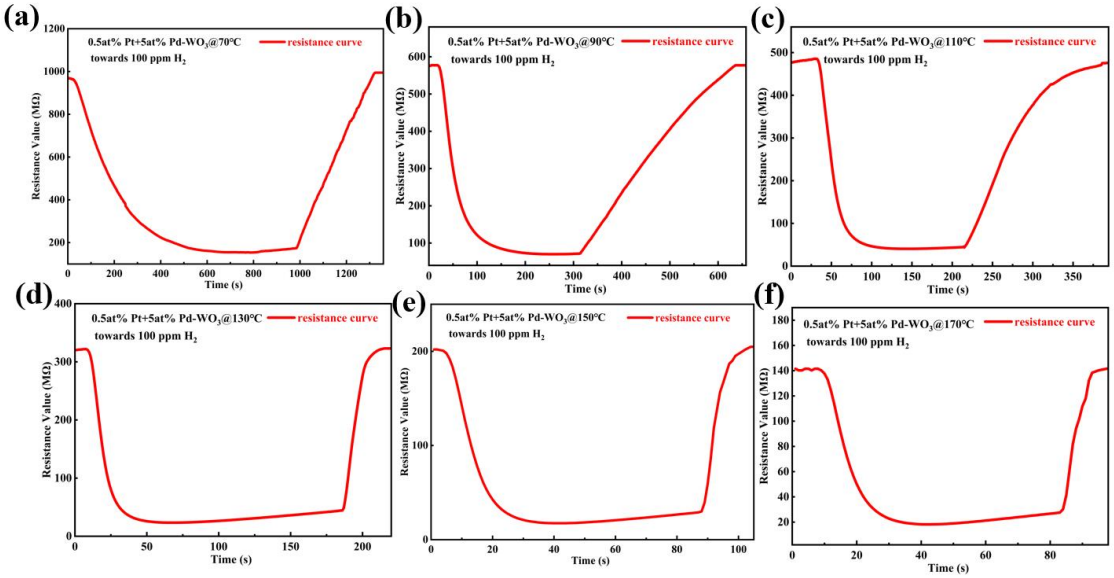

Fig.S5: (a)-(f) The real-time resistance variation of the sensor based on 0.5 at% Pt and 5 at% Pd decorating WO_3 film towards 100 ppm H_2, tested at 70, 90, 110, 130, 150 and 170 ℃, respectively.

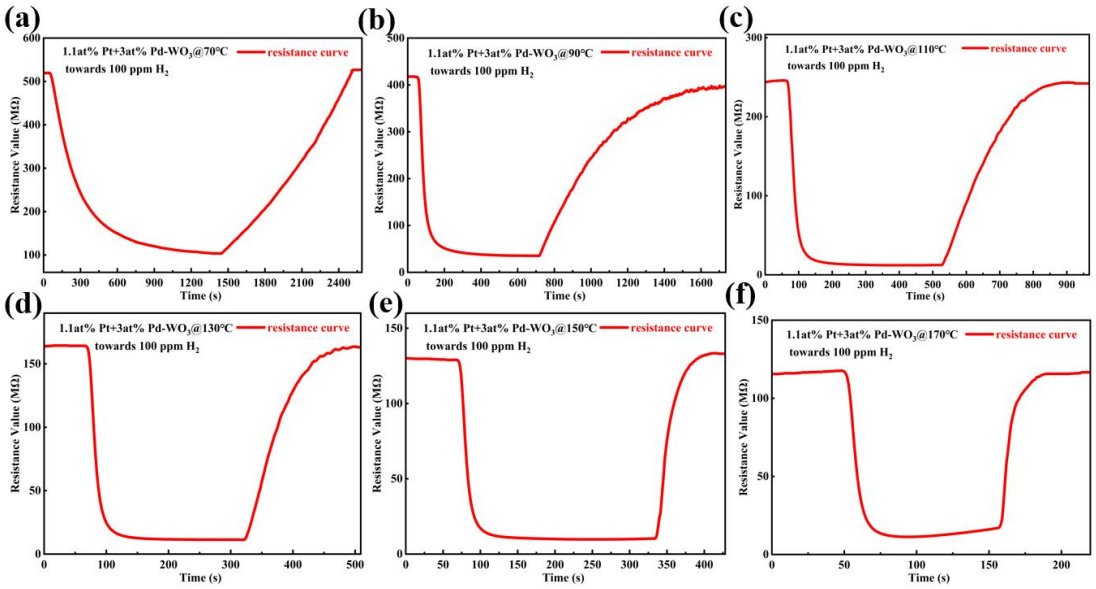

Fig.S6: (a)-(f) The real-time resistance variation of the sensor based on 1.1 at% Pt and 3 at% Pd decorating WO_3 film towards 100 ppm H_2, tested at 70, 90, 110, 130, 150 and 170 ℃, respectively.

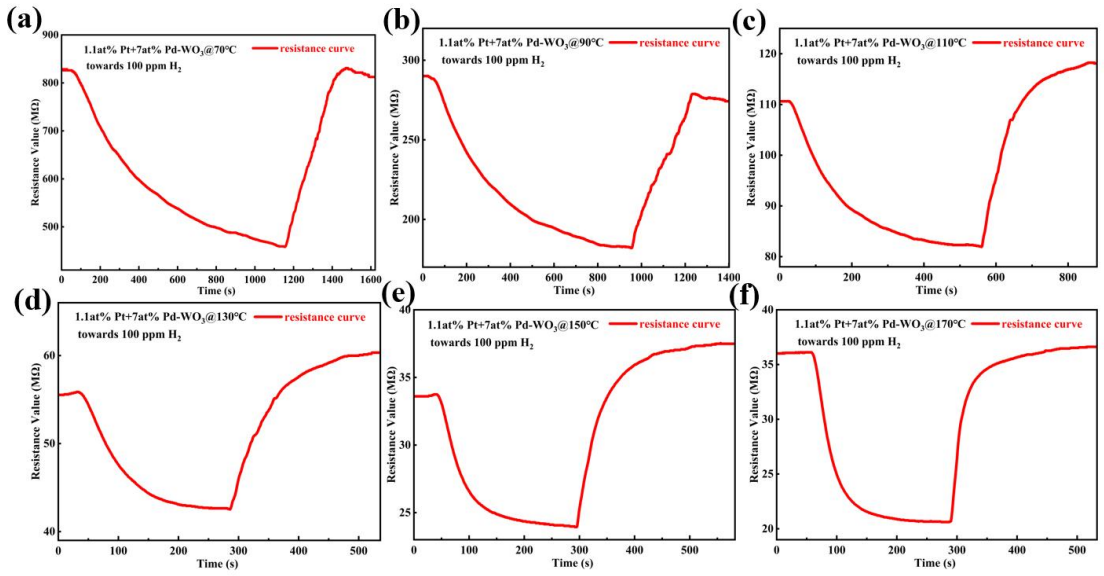

Fig.S7: (a)-(f) The real-time resistance variation of the sensor based on 1.1 at% Pt and 7 at% Pd decorating WO_3 film towards 100 ppm H_2, tested at 70, 90, 110, 130, 150 and 170 ℃, respectively.

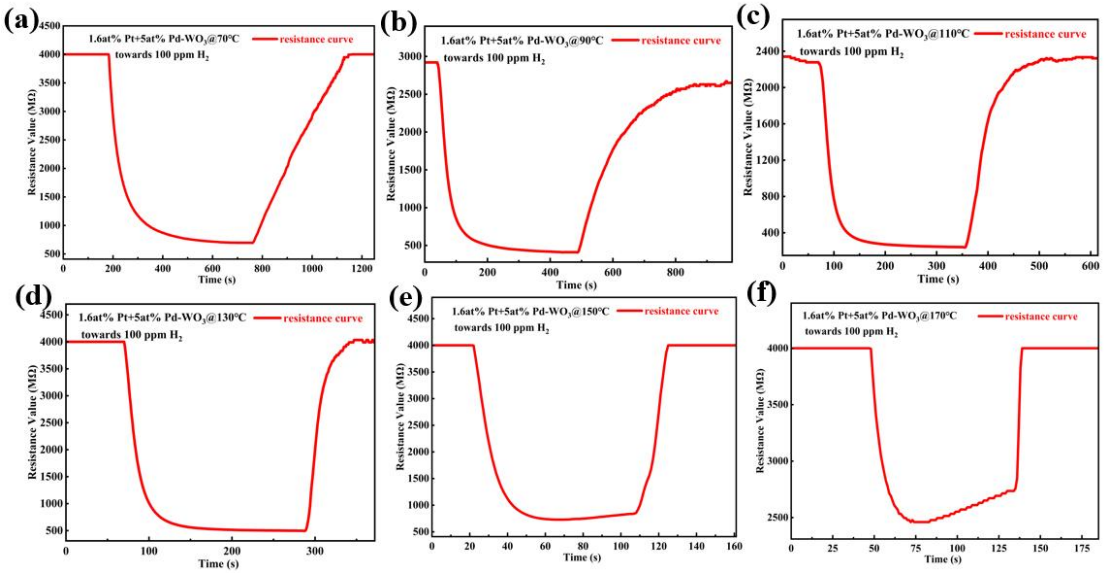

Fig.S8: (a)-(f) The real-time resistance variation of the sensor based on 1.6 at% Pt and 5 at% Pd decorating WO_3 film towards 100 ppm H_2, tested at 70, 90, 110, 130, 150 and 170 ℃, respectively.

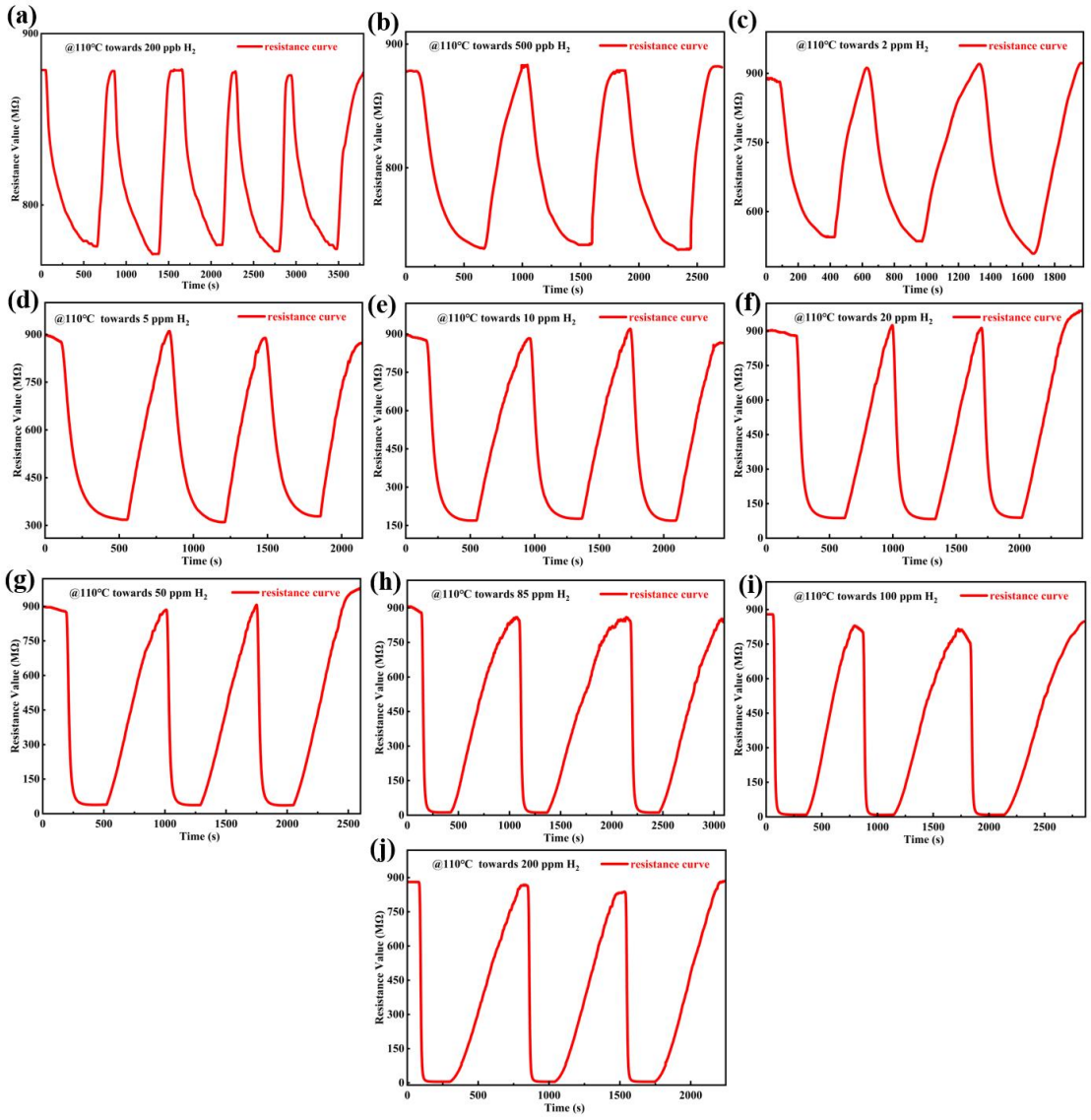

Fig.S9: (a)-(j) Repeatability test of Sensor B based on 1.1 at% Pt and 5 at% Pd decorating WO_3 film for drawing error bars towards 200 ppb-200 ppm H_2.

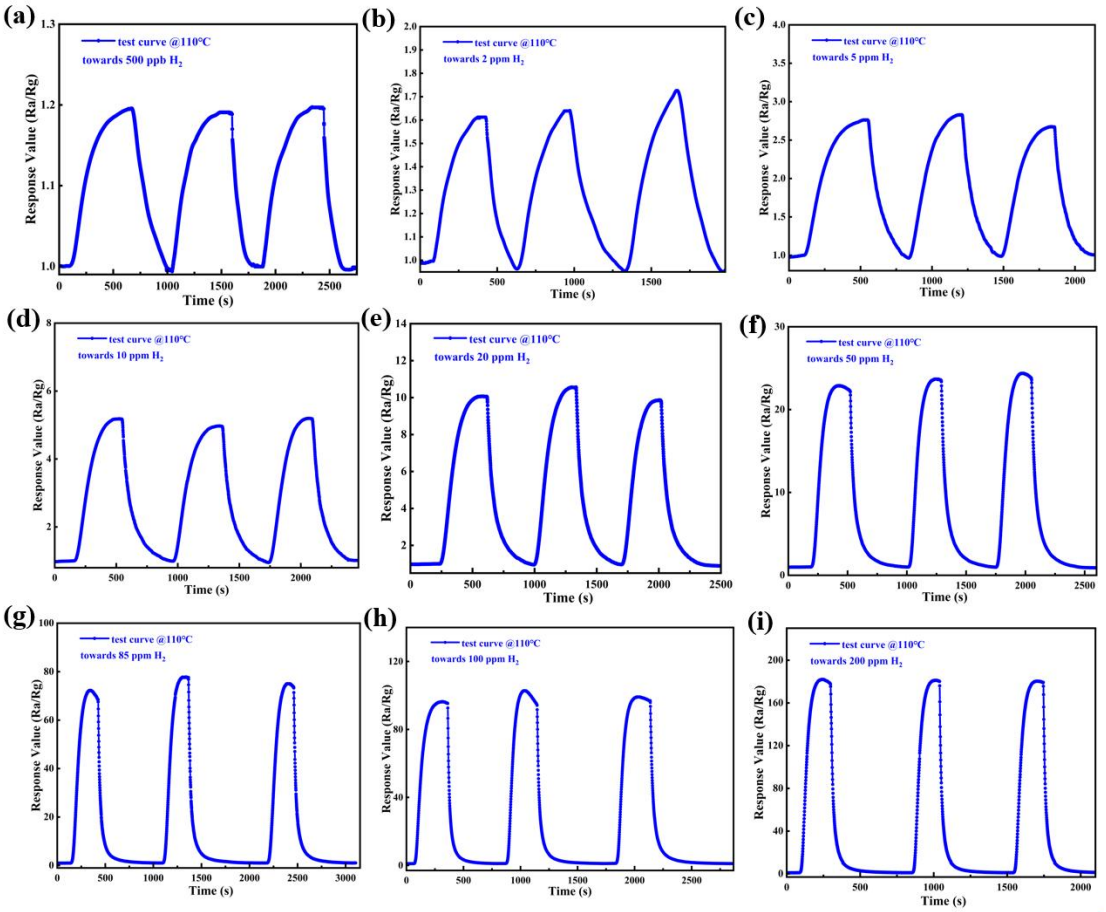

Fig.S10: (a)-(i) Reproducibility of the sensor's response to different concentrations of H_2 in order to draw the error bars.

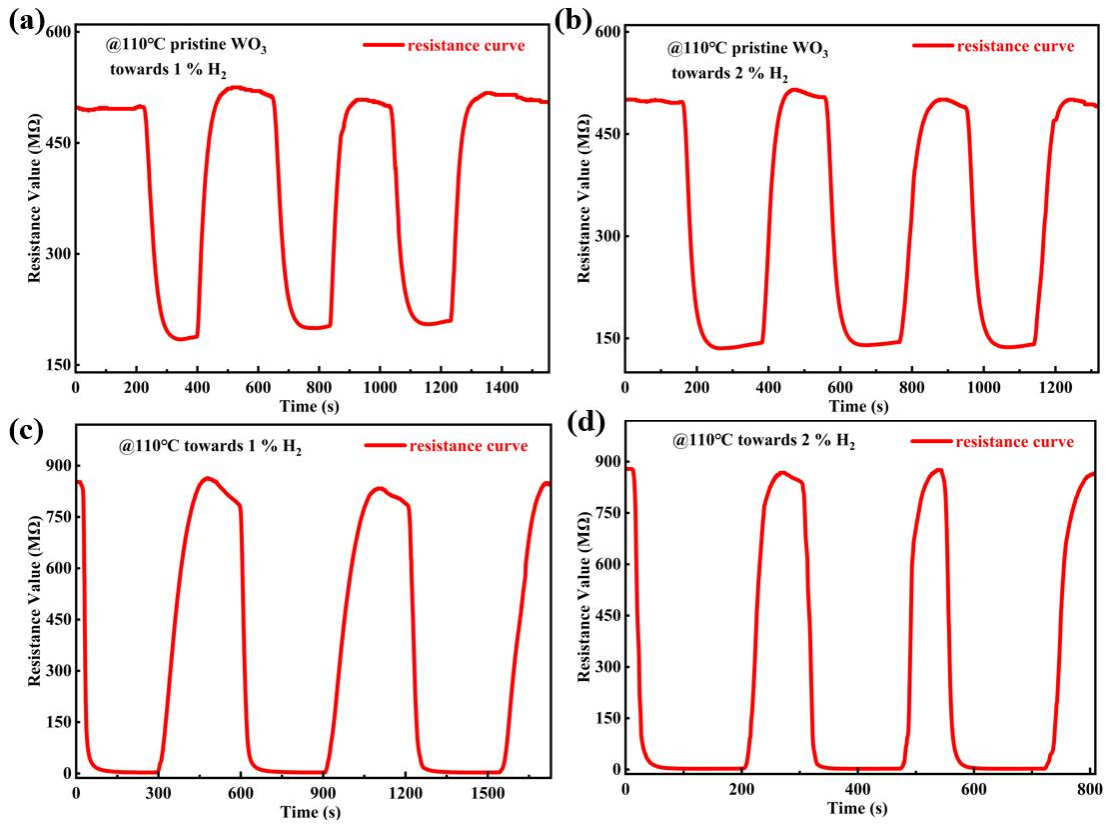

Fig.S11: (a)-(b) The real-time resistance of pure WO_3 film to high concentrations of H_2 at 1% and 2%. (c)-(d) The real-time resistance of Sensor B to high concentrations of H_2 at 1% and 2%.

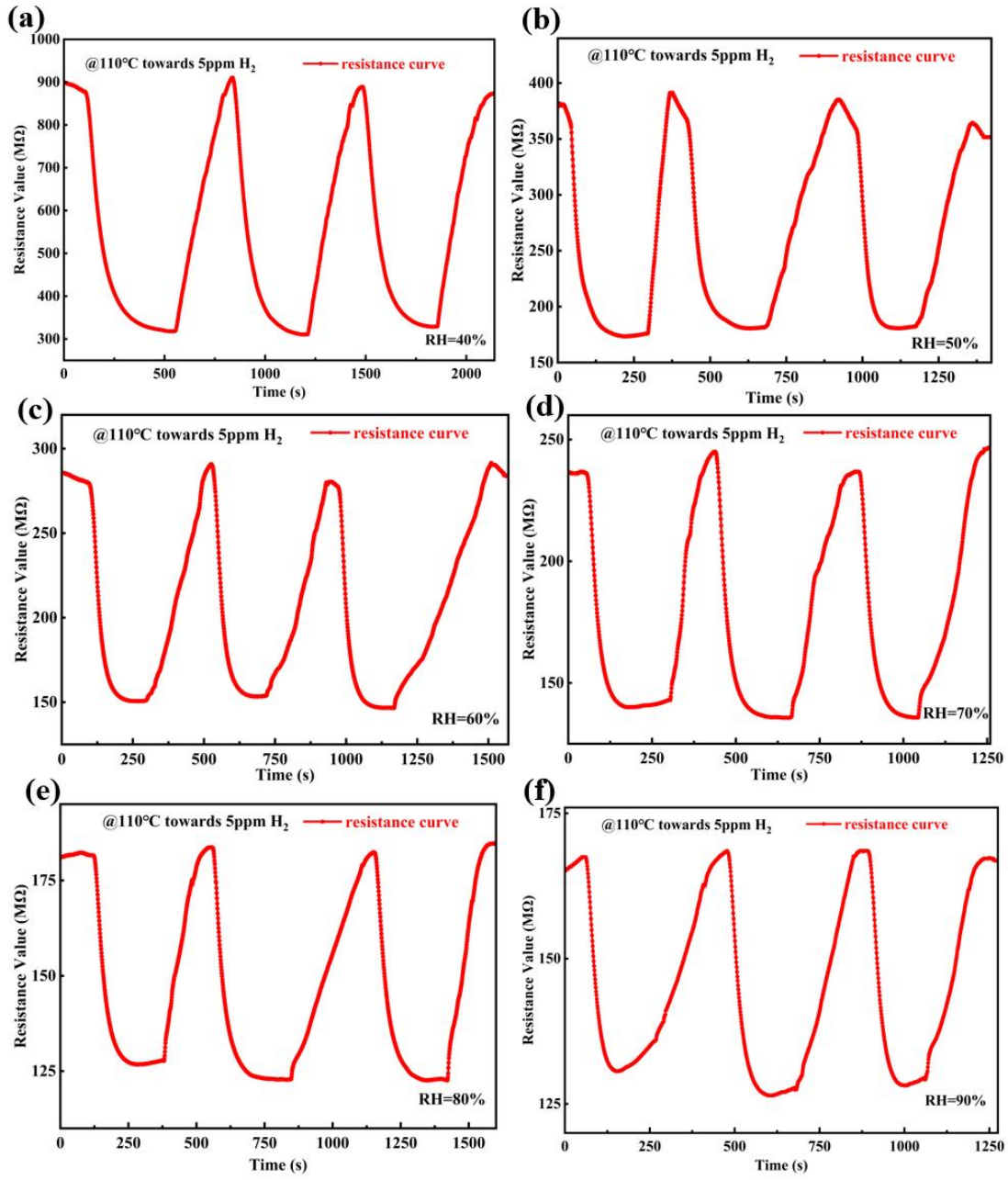

Fig.S12: (a)-(f) The influence of humidity on the response of Sensor B.

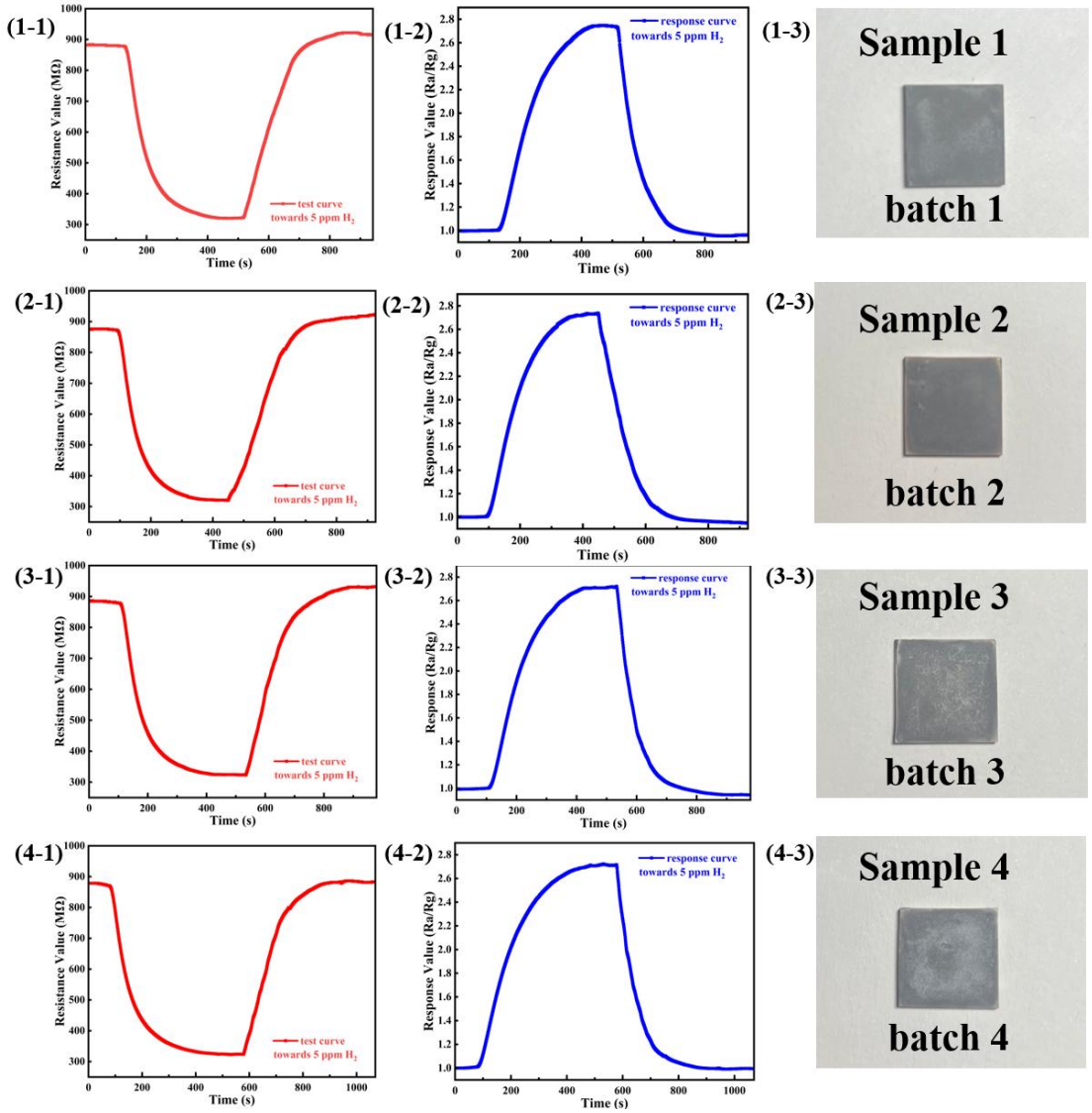

Fig.S13: (1-1) The real-time resistance variation of Sensor 1 toward 5 ppm H_2, at 110 ℃. (1-2) The response curve corresponding to (1-1). (1-3) The photograph of Sensor 1. (2-1)-(4-3) are the same.

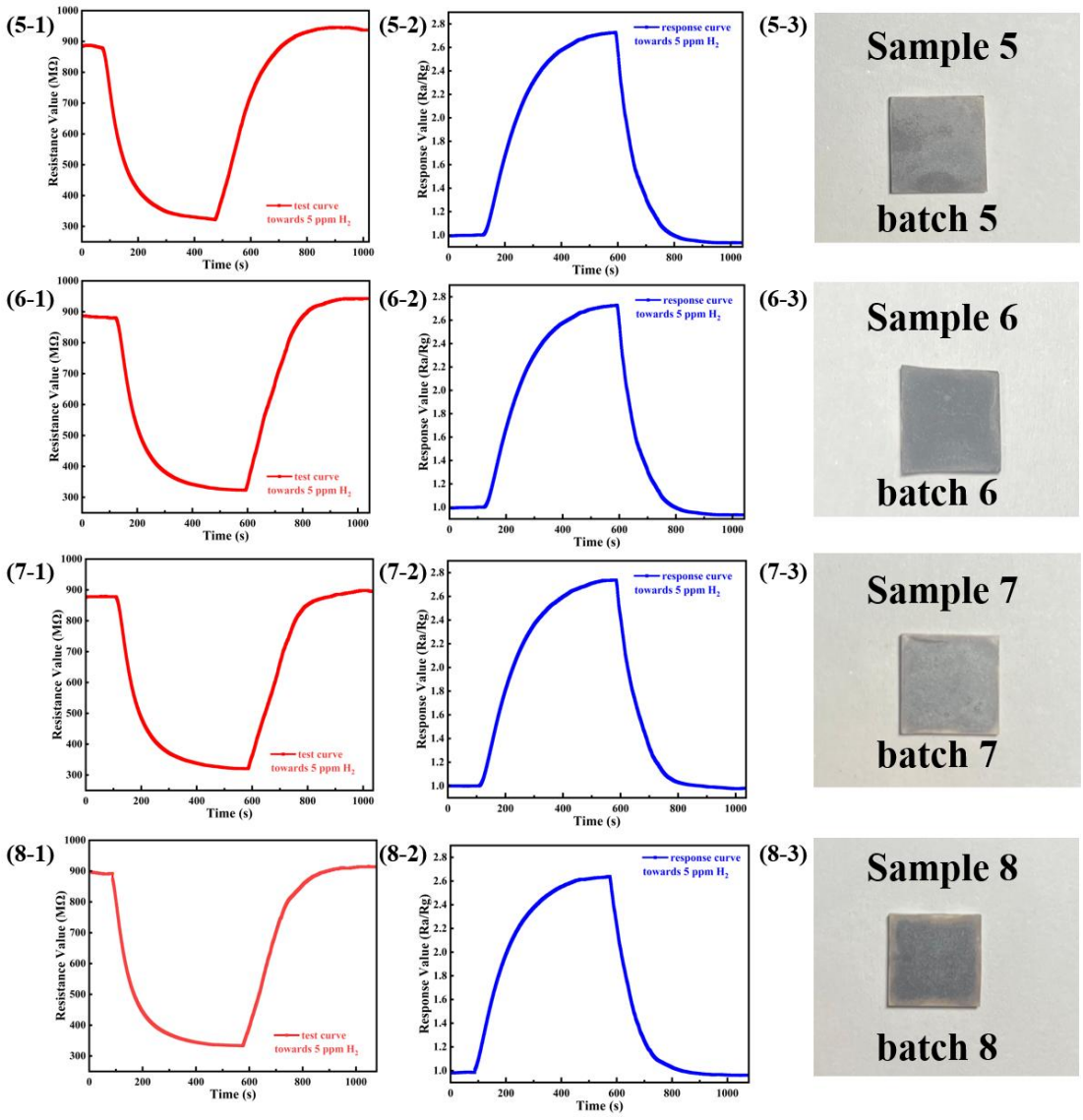

Fig.S14: (5-1) The real-time resistance variation of Sensor 5 toward 5 ppm H_2, at 110 ℃. (5-2) The response curve corresponding to (5-1). (5-3) The photograph of Sensor 5. (6-1)-(8-3) are the same.

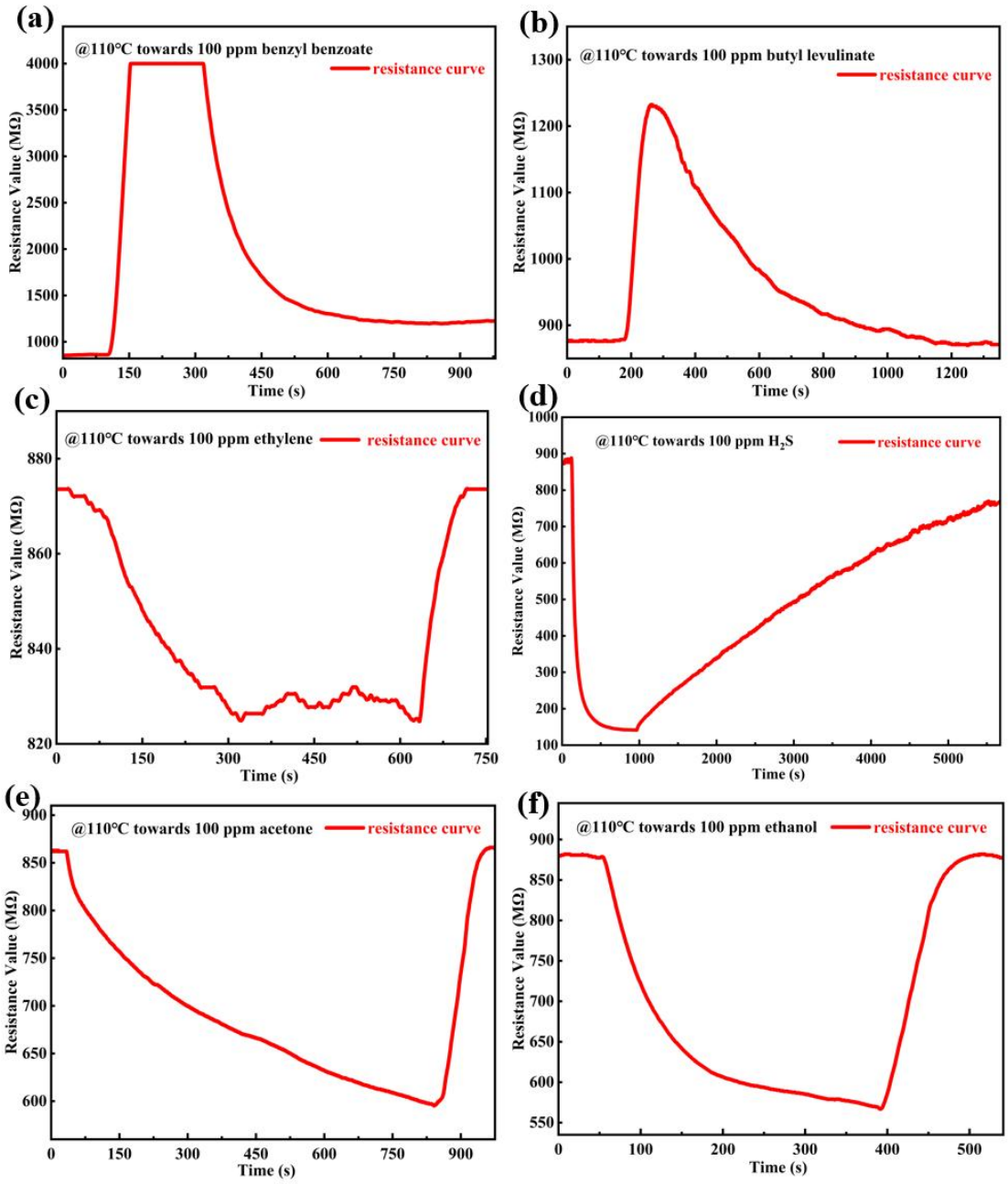

Fig.S15: (a)-(f) The selectivity test of Sensor B towards reference gases.

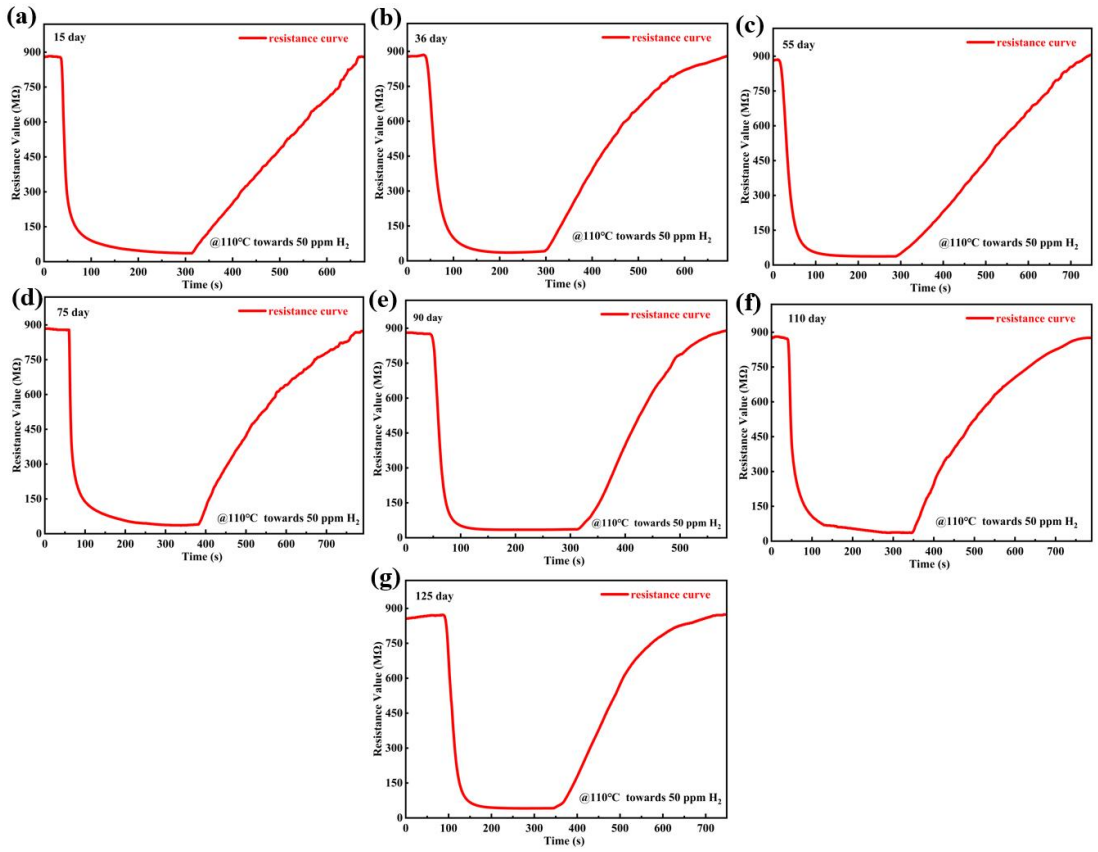

Fig.S16: (a)-(g) The long-term stability test of Sensor B.