Supporting Information for

Influence of hydrogen incorporation on conductivity and work function of VO_2 nanowires

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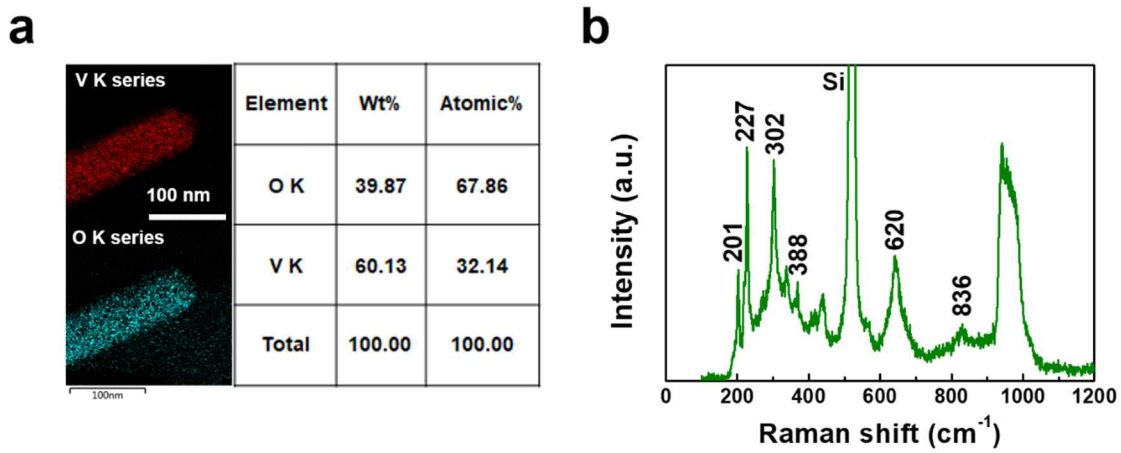

Fig. S1 (a) EDS mapping of the VO_2 NWs. (b) Raman spectrum of the as-grown VO_2 nanowires on a Si substrate.

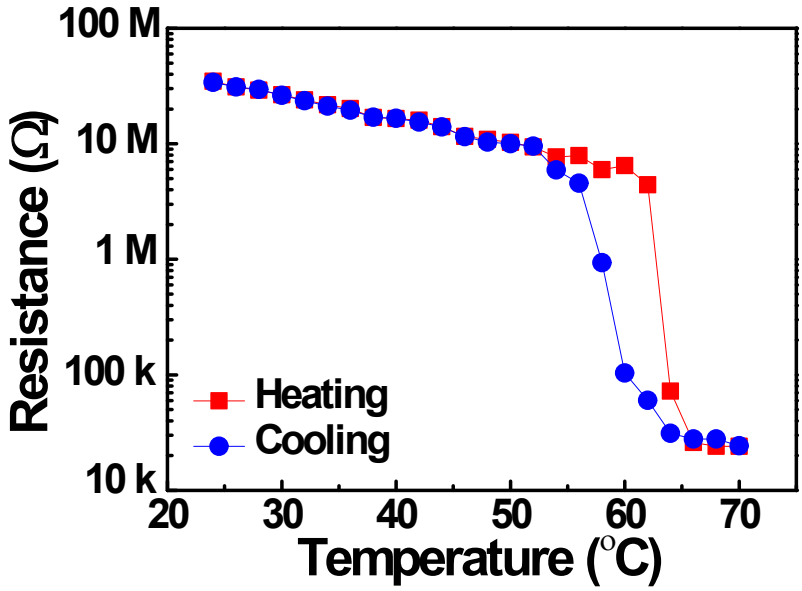

Fig. S2 Plot of the resistance of the VO_2 NW as a function of temperature while heating and cooling that exhibits hysteresis of the R–T curve.

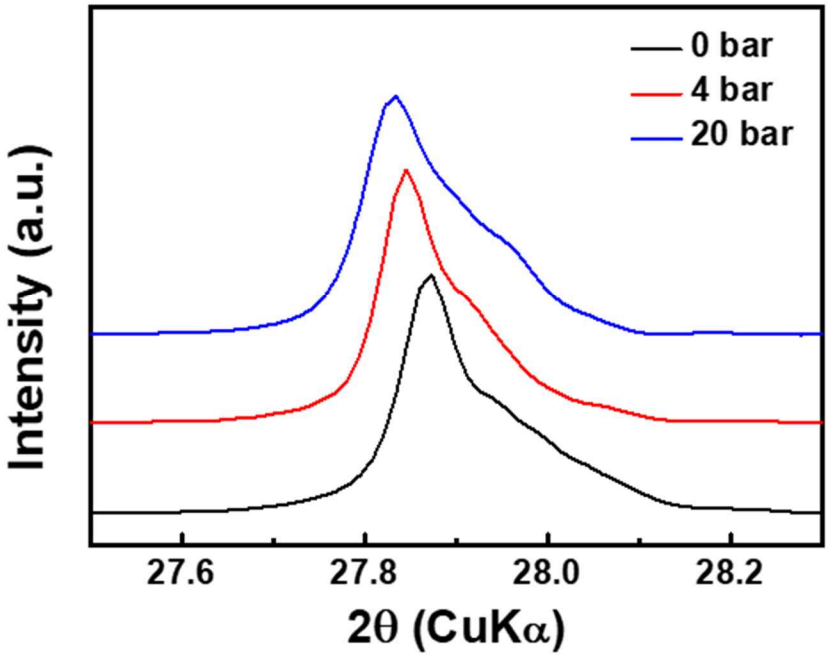

Fig. S3 (a) Narrow scan XRD of the (011) peak of VO_2. The peak shift means that the incorporated hydrogen atoms induced lattice distortion and increased the lattice parameters.

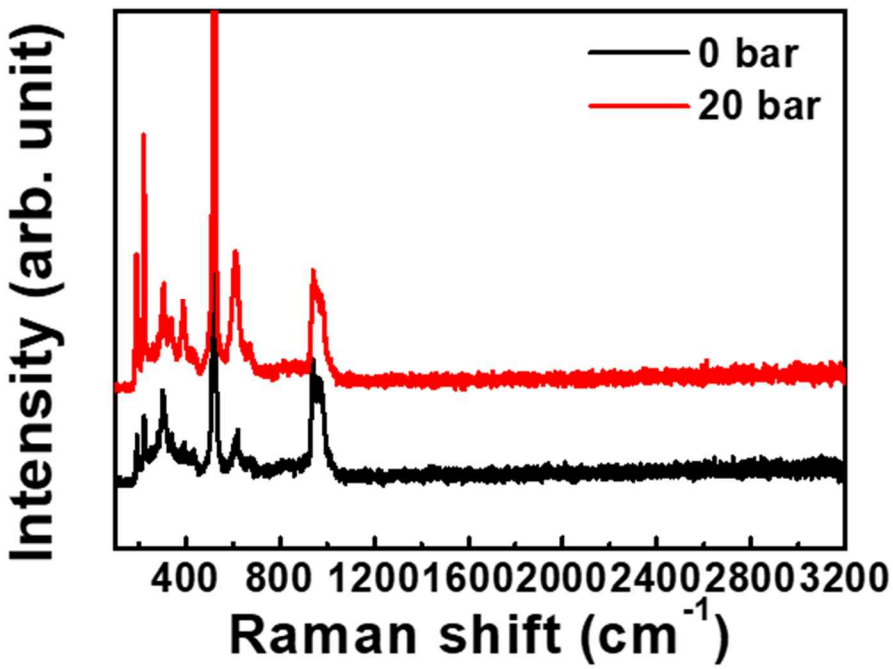

Fig. S4 Raman spectra of the hydrogen-doped (red: hydrogenated at 20 bar of hydrogen) and pristine (black) VO_2 nanowires.

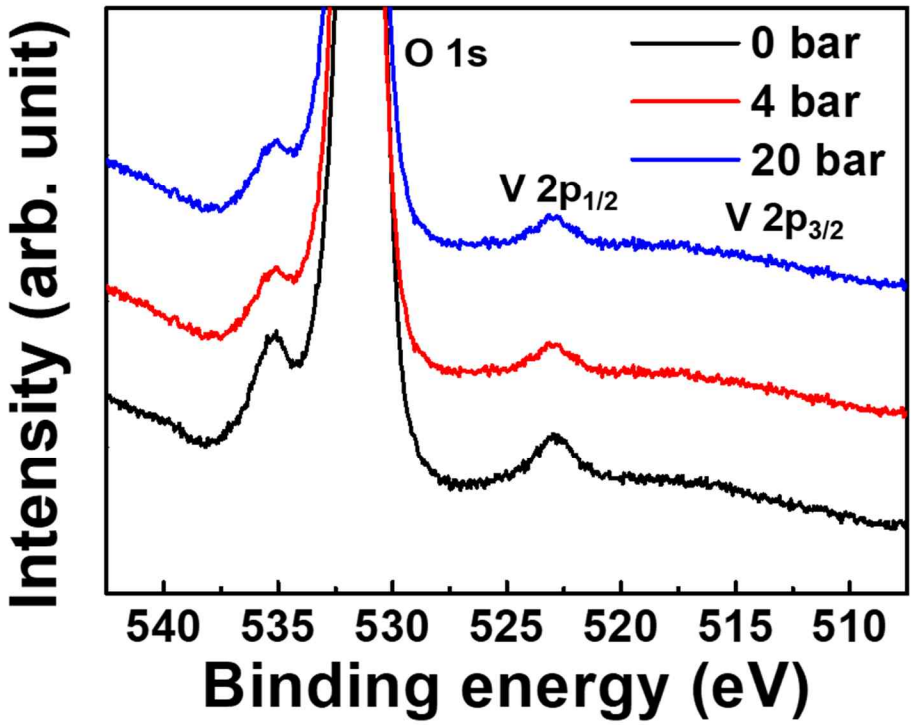

Fig. S5 XPS spectrum of the bare and hydrogenated VO_2 NWs. There is no significant change in the chemical bonds of the V and O.

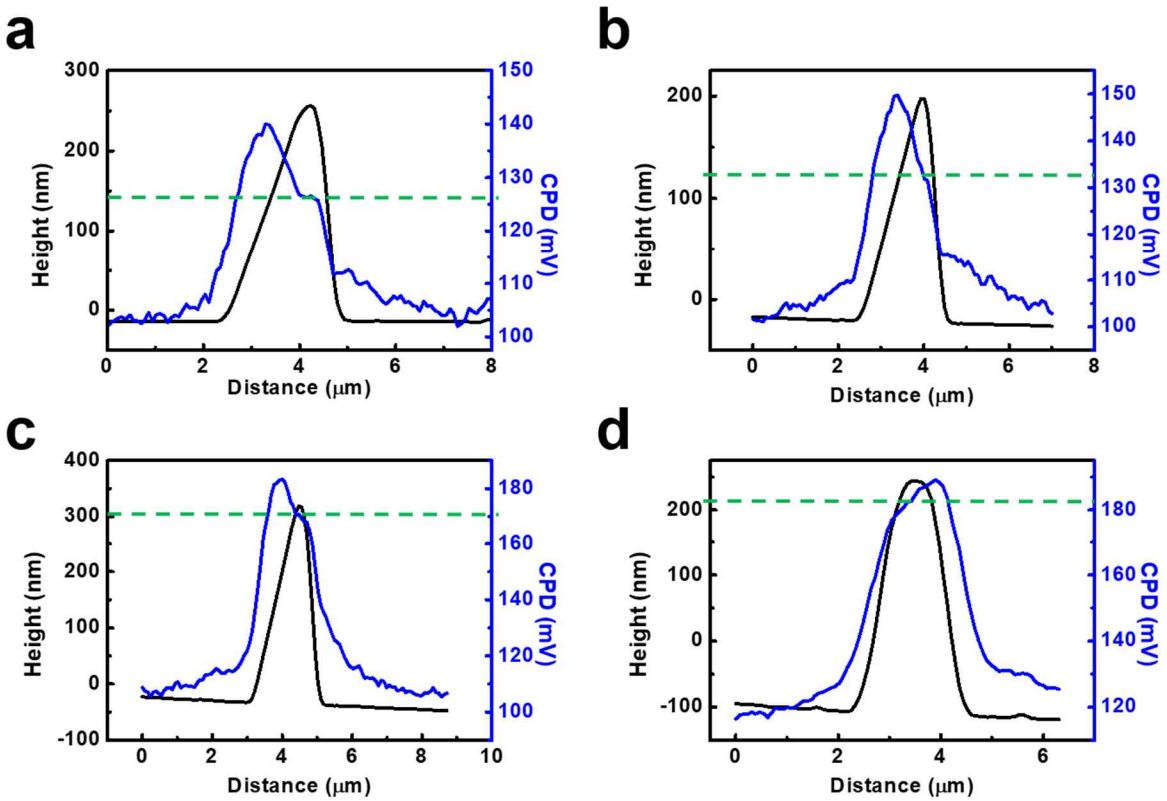

Fig. S6 Line profile of the height and CPD of the hydrogenated VO_2 NWs under H_2 pressures of (a) 0, (b) 4, (c) 6, and (d) 20 bar. The green dashed lines indicate the CPD values of the (110) surface of the VO_2 NWs. Since the data were acquired when the tip retraced, there is an artifact that occurs when the tip is higher than the set lift height.

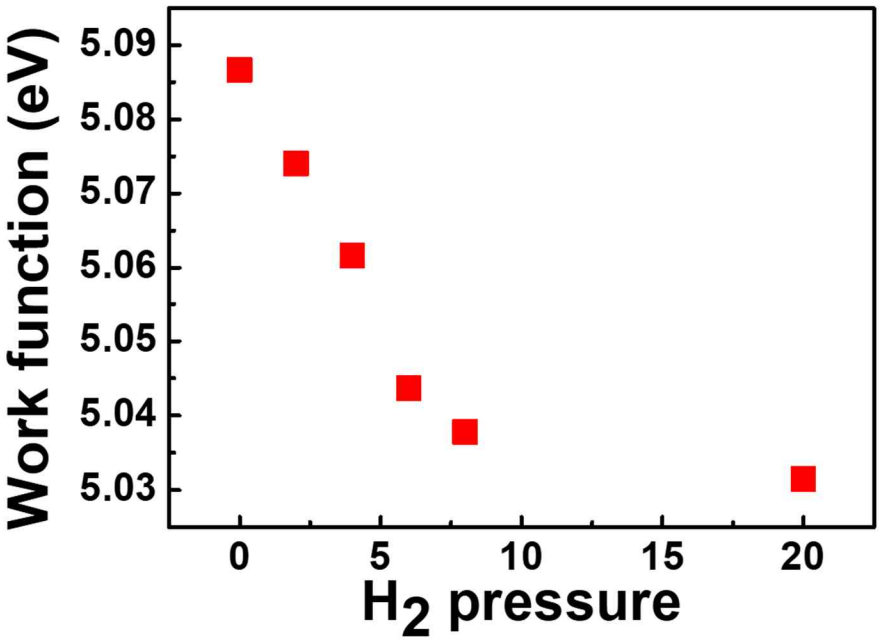

Fig. S7 Work function of the VO_2 NWs on Au/mica substrates, assuming that the work function of Au is 5.1 eV.

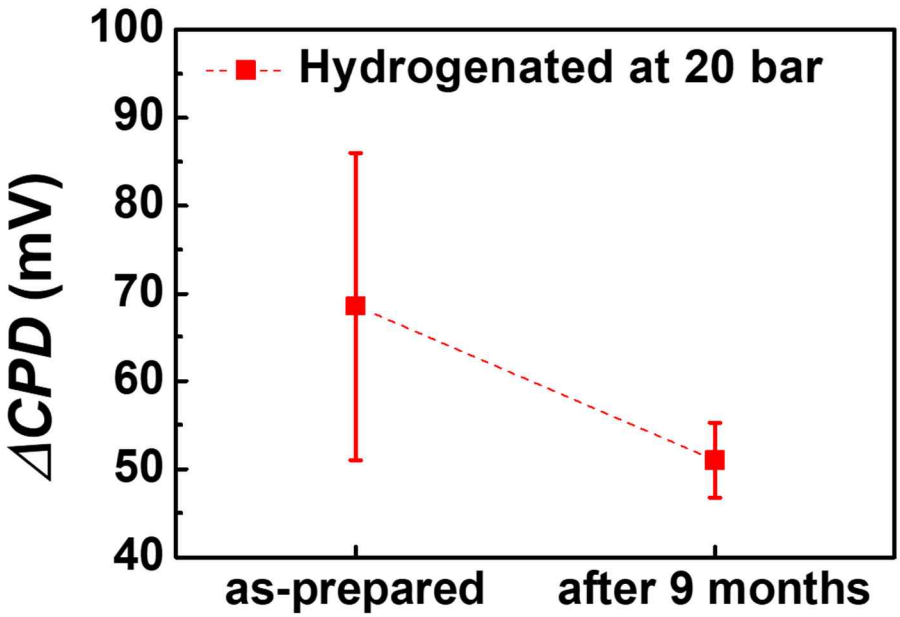

Fig. S8 Surface potential decay of hydrogenated VO_2 NWs on Au-deposited Si substrates at 20 bar after 9 months.