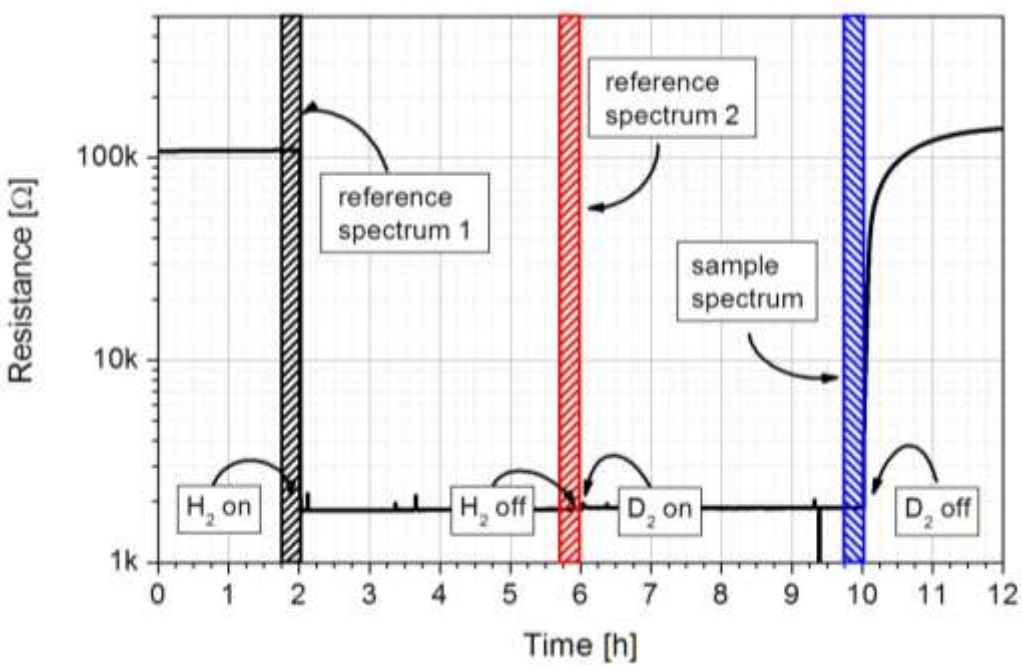

Figure S1 - Resistance measurement of the undoped SnO_2 material at 300°C in dry air. The sensor was exposed to 200ppm H_2 for 4 hours, followed directly by 200ppm D_2 for 4 hours. The rectangles indicate the times when the respective DRIFT spectra were recorded. For our purpose the absorbance spectrum was calculated by dividing the sample spectrum through the reference spectrum 2. This has the advantage of a lower background absorption difference (same free carrier absorption) between the two spectra.

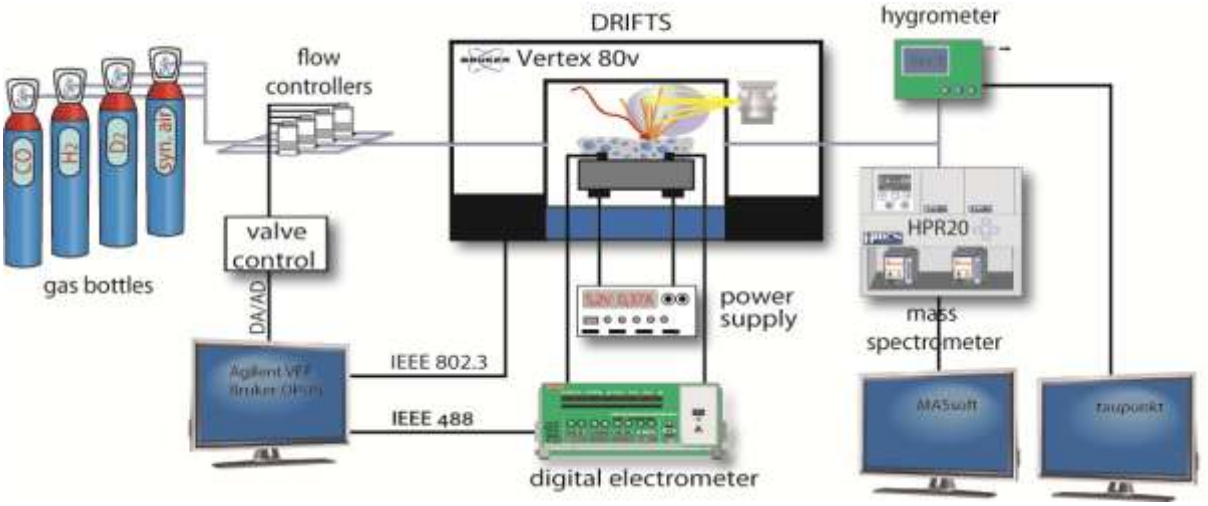

Figure S2 – Operando DRIFTS set-up; equipped with a FT-IR spectrometer (Bruker VERTEX 80v), a digital electrometer (Keithley 617), a mass spectrometer (Hiden, HPR 20, analyzer, quadrupole), and a hygrometer (Vaisala, Drycap Dewpoint Transmitter DMT 152).

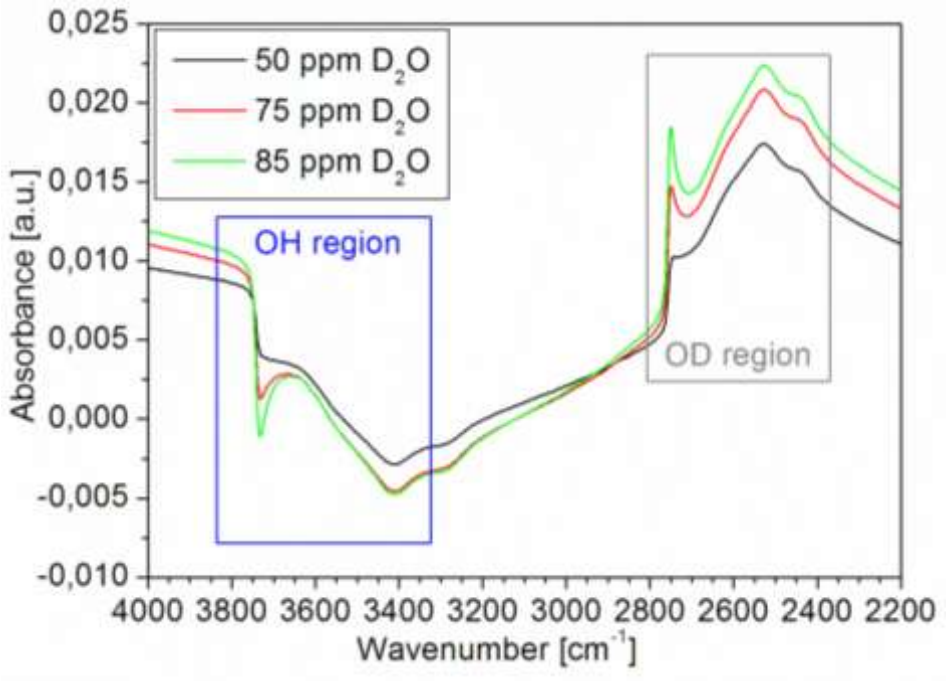

Figure S3 – 50, 75, and 85ppm D_2O in N_2 dosed on the Pt doped SnO_2 sensor at 300°C. The spectra show that while the OH groups decrease reaches a maximum the OD groups still increases. Reference spectrum: N_2.

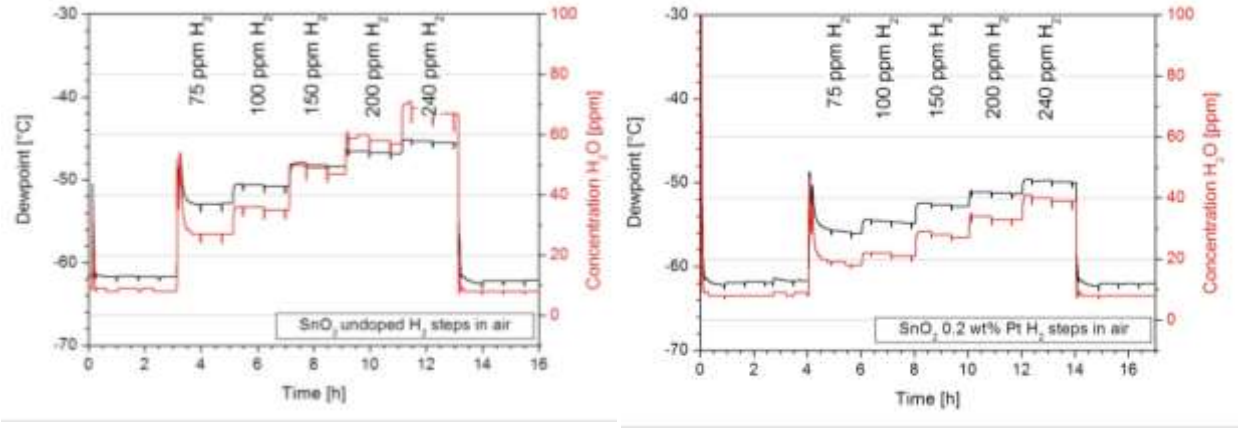

Figure S4 – Hygrometer measurement on undoped and Pt doped SnO_2 sensor exposed to different H_2 concentrations (75, 100, 150, 200, 240ppm) in air at 300°C. The corresponding DRIFTS measurements are displayed in Figure 4.

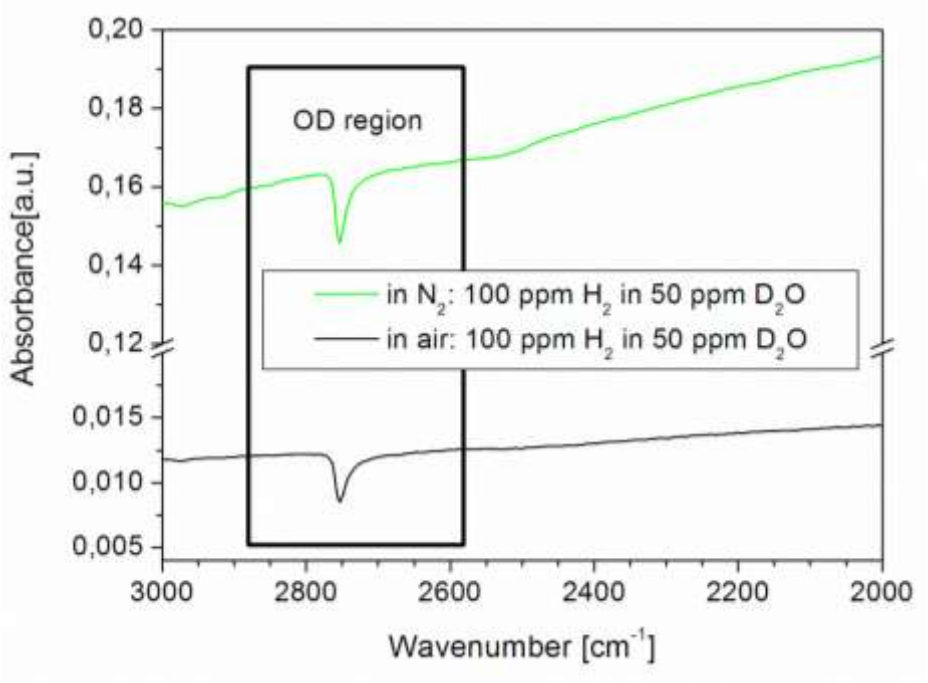

Figure S5 – Absorbance spectra of SnO_2:Pt at 300°C. The sensor was kept in 50ppm D_2O for 24 hours before dosing 100ppm H_2 for 2 hours. Black line: measurement of 100ppm H_2 in N_2 in a background of 50ppm D_2O; reference: 50ppm D_2O in N_2; Grey line: measurement with 100ppm H_2 in air in a background of 50ppm D_2O; reference spectrum: 50ppm D_2O in air.

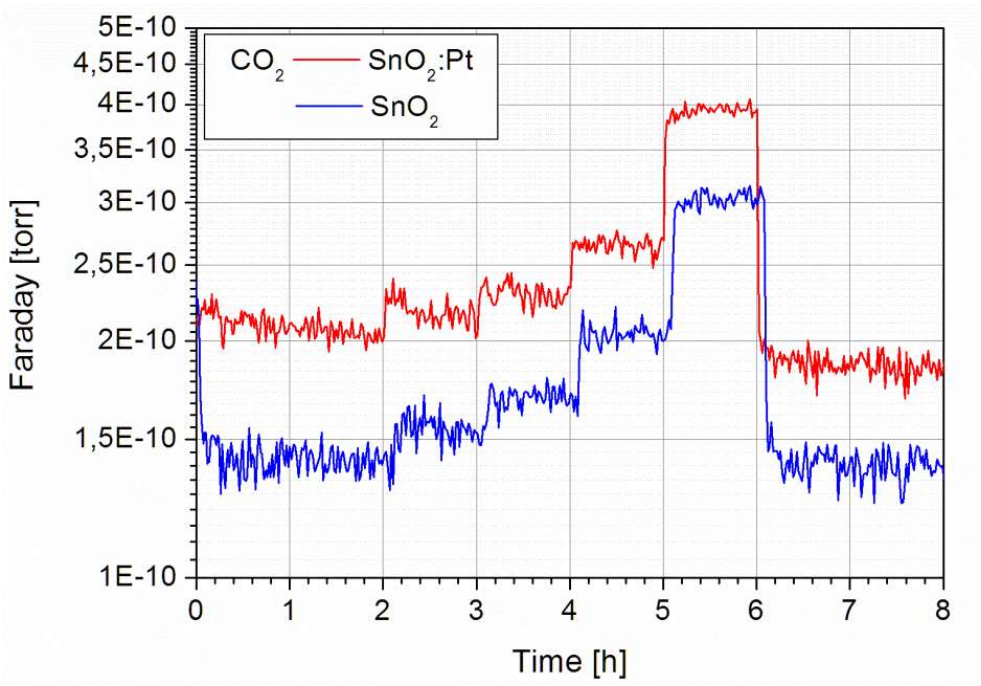

Figure S6 - MS measurement of undoped SnO_2 and SnO_2:Pt with CO steps (70, 100, 150, 240ppm) in dry synthetic air at 300°C. The corresponding DRIFTS measurements are displayed in Figure 7.