

Supplemental Information

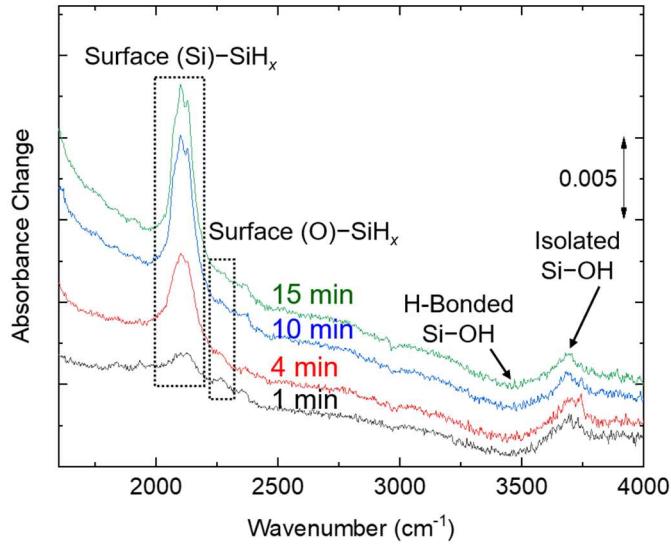


Figure 1: Infrared absorbance change of an RCA-oxide-coated Si(100) internal reflection crystal after 1, 4, 10, and 15 min of exposure of a H₂ plasma at room temperature. The increase in absorbance at $\sim 2100\text{ cm}^{-1}$ corresponds to $-\text{SiH}_x$ ($x = 1, 2, 3$) stretching vibrations on the Si(100) surface. There is a corresponding decrease in absorbance at $\sim 3500\text{ cm}^{-1}$ corresponding to hydrogen-bonded $-\text{SiOH}$ groups and an increase in absorbance at $\sim 3750\text{ cm}^{-1}$ corresponding to isolated $-\text{SiOH}$ groups. The Si internal reflection crystal cuts off in the infrared at $\sim 1500\text{ cm}^{-1}$, which prevented the direct observation of the Si–O–Si phonon modes in the 800–1250 cm^{-1} region.

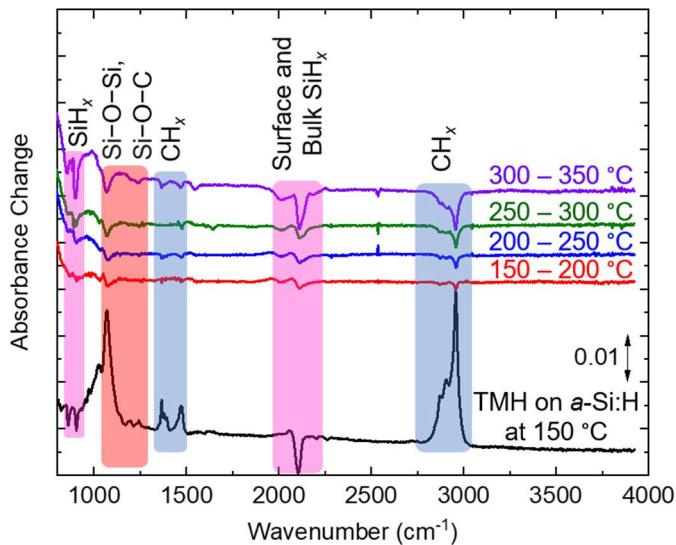


Figure 2: Infrared absorbance change of 3,5,5-trymethylhexanal (TMH) on a PECVD *a*-Si:H film at 150 °C (—), followed by heating to 200 (—), 250 (—), 300 (—) and 350 (—) °C. The reference spectrum for the initial TMH adsorption is the *a*-Si:H film immediately prior to TMH exposure. The reference spectrum for the red curve is the black curve, and each subsequent spectrum references the spectrum

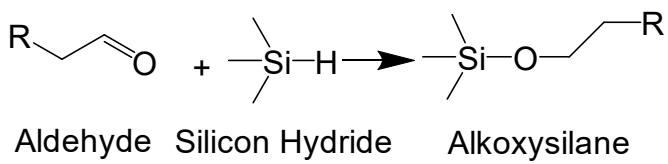


Figure 3: Reaction pathways of aldehydes with silicon hydrides.