

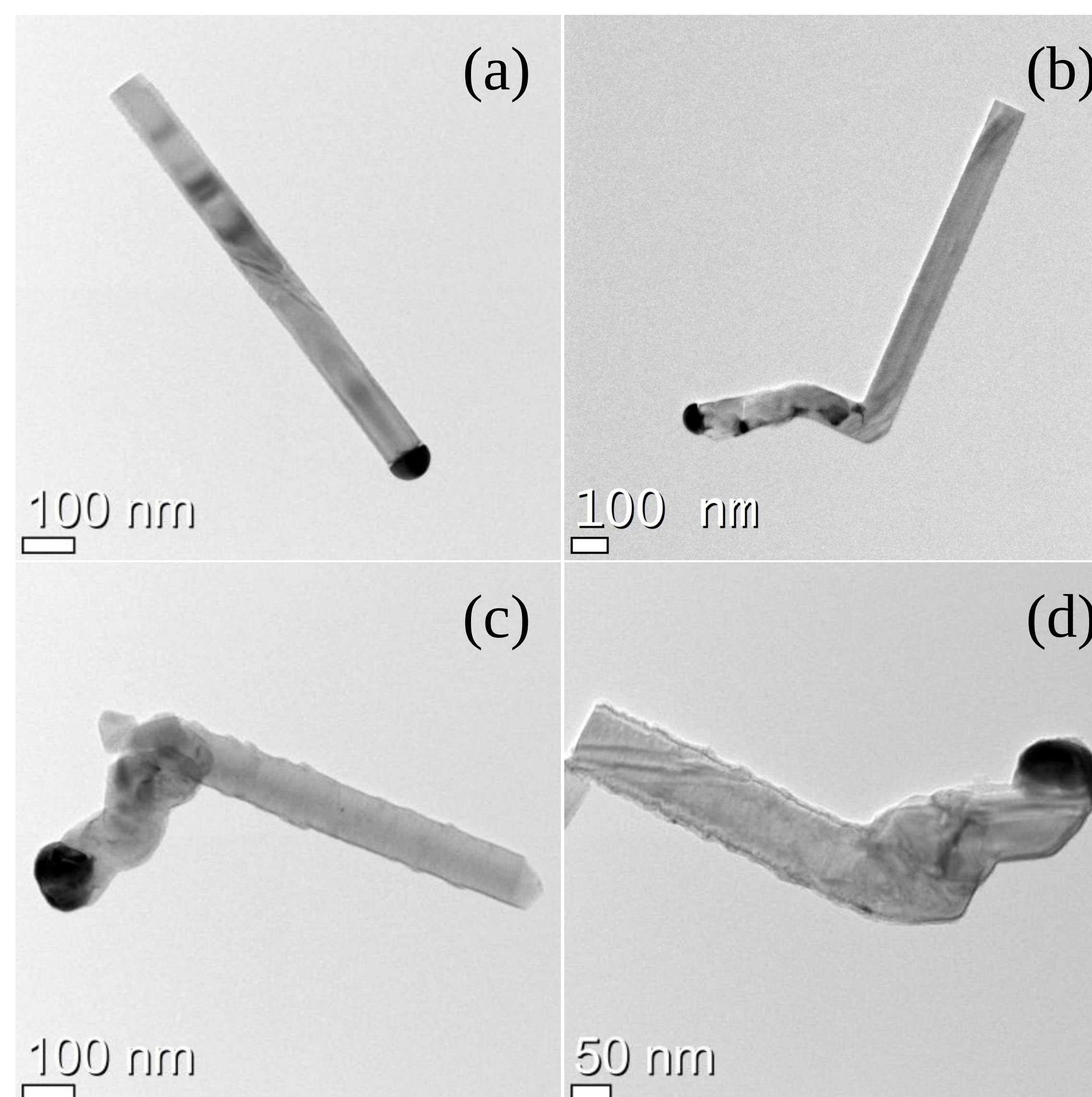


Figure S1. TEM images of $\text{Si}_{1-x}\text{C}_x$ NWs grown as a function of flow rate ratio of SiH_4 to CH_3SiH_3 gas.
 (a) As-grown SiNWs with straight sidewall. The gas flow ratio of SiH_4 to CH_3SiH_3 gas in $\text{Si}_{1-x}\text{C}_x$ NWs is controlled: (b) 10 to 1, (c) 10 to 1.5 and (d) 10 to 2.

Supporting Figure S1. Lee *et al.*

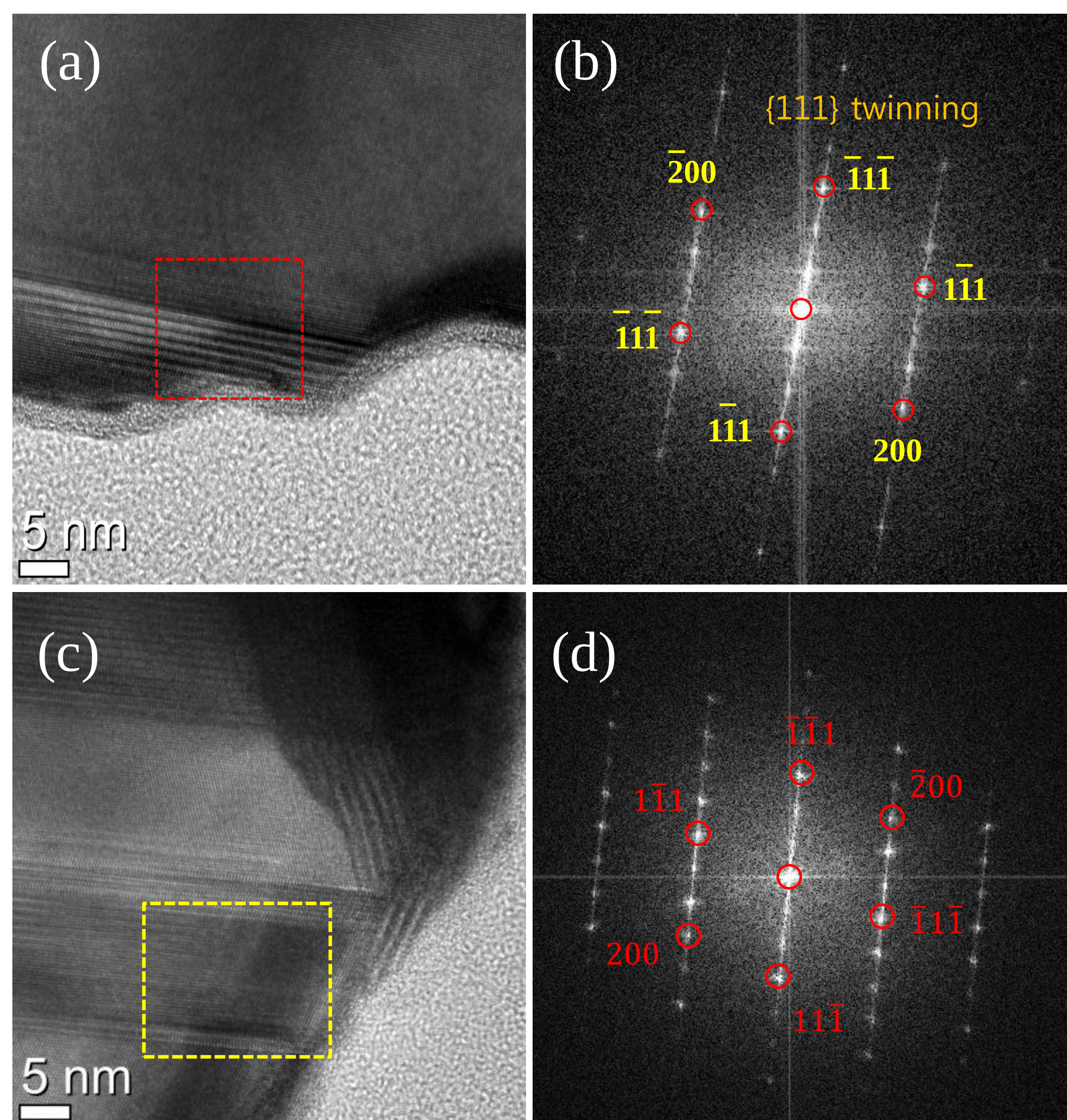


Figure S2. These figures indicated the similar twin defect generated in as-grown SiNWs and Si_{1-x}C_x NWs. The HR-TEM images and FFT image of SiNWs [ref. 17] and Si_{1-x}C_x NWs are presented in (a), (b) and (c), (d), respectively.

Supporting Figure S2. Lee *et al.*

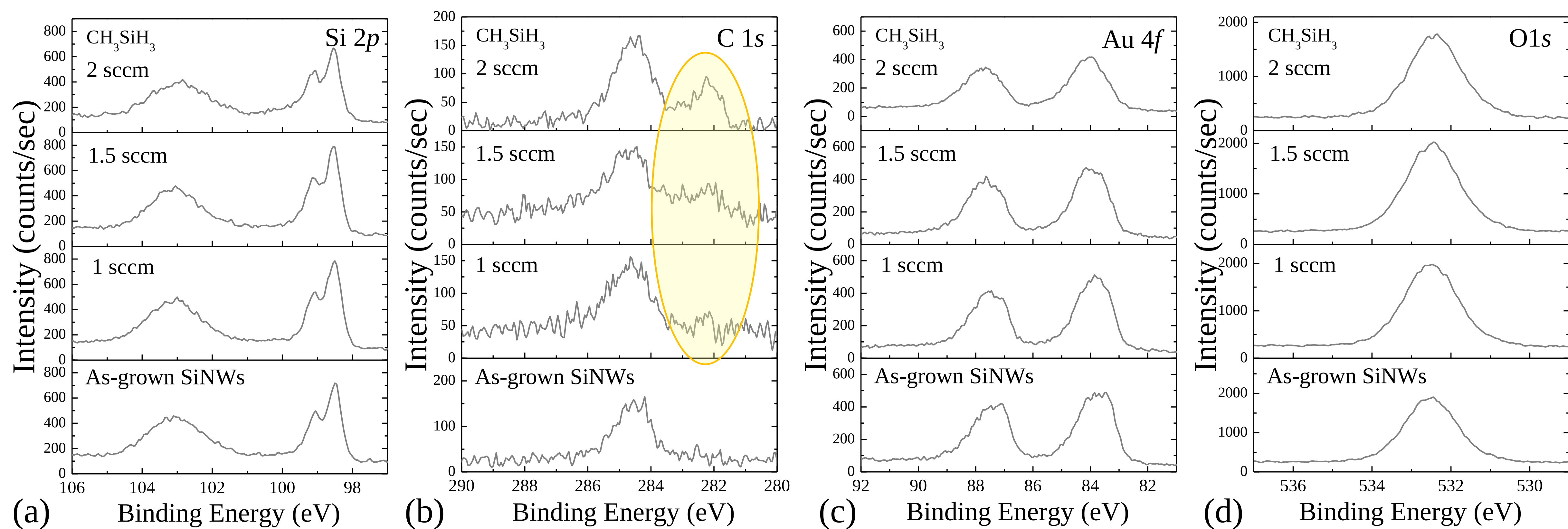


Figure S3. XPS results of as-grown SiNWs and $\text{Si}_{1-x}\text{C}_x$ NWs as a function of CH_3SiH_3 gas flow rate.

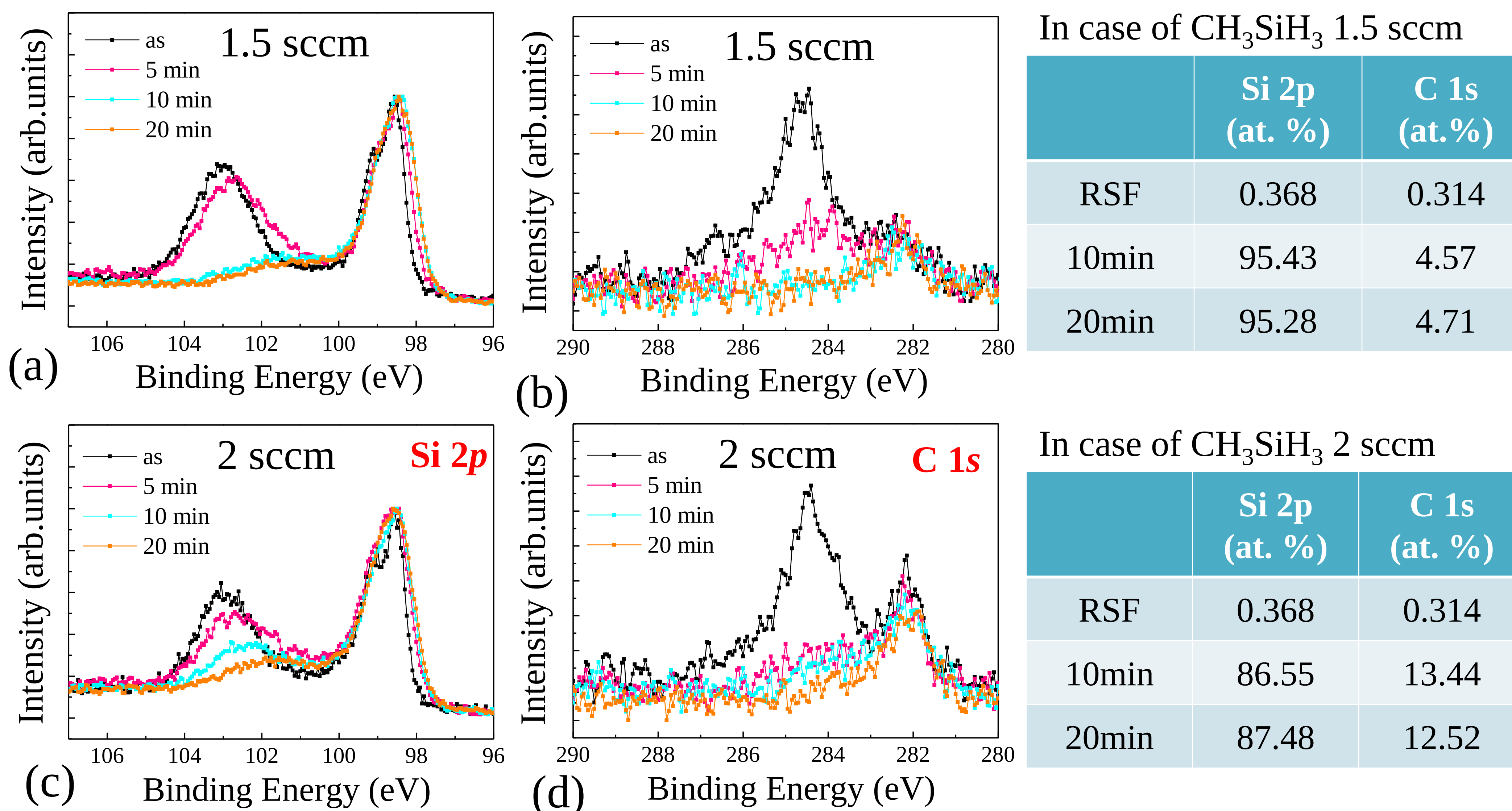


Figure S4. Sputtering results (Si 2p, C 1s) of Si_{1-x}C_x NWs in case of CH₃SiH₃ gas flow rate of 1.5 and 2 sccm. After sputtering process for 35 min, native oxide peak at near 103 eV in Si 2p and weakly bound C atoms in C 1s disappeared while the peak at near 282 eV in C 1s remained maintaining their intensity. The relative atomic concentration between pure Si and C could be obtained in case of sputtering process for 10, 20 min and it was calculated as presented in right-handed tables by using compositional analysis formula which is generally well-known [refer to *J. Phys. Chem. C* **2010**, 114, 15274].

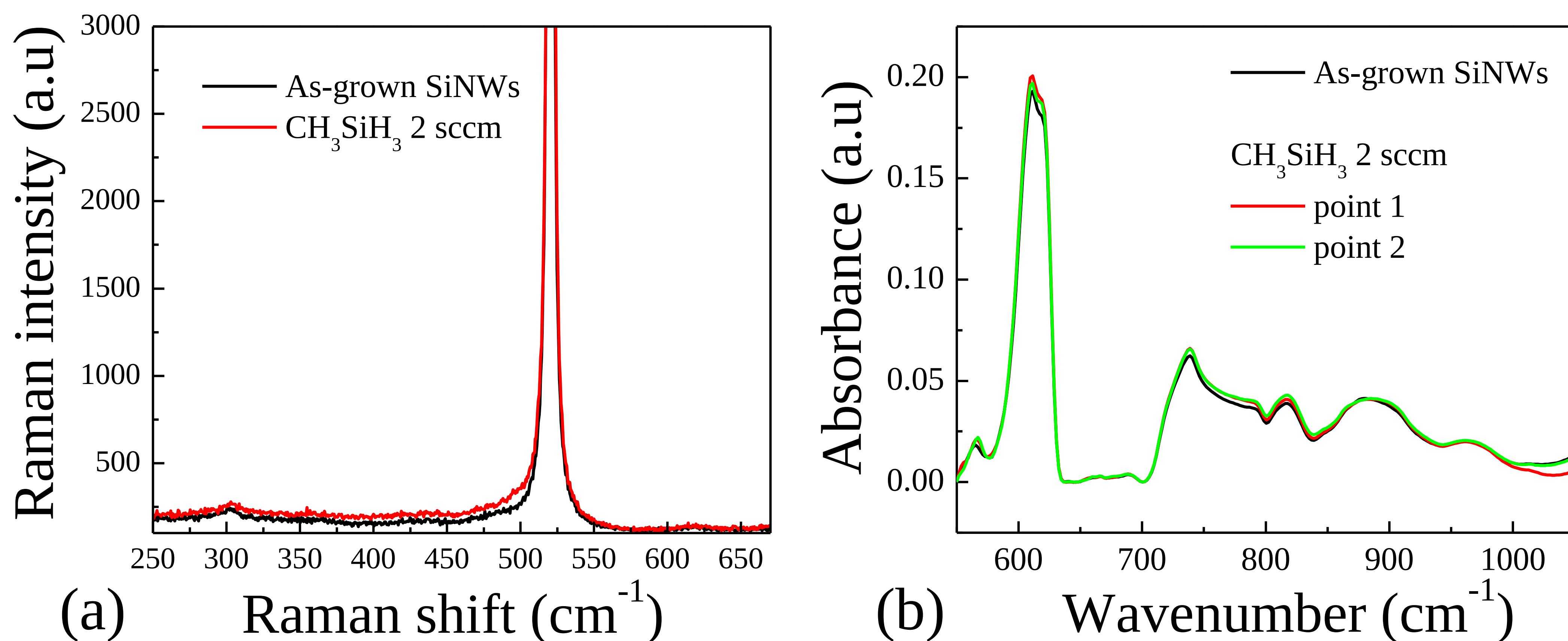


Figure S5. Raman (a) and FT-IR (b) spectra of Si_{1-x}C_x NWs in case of CH₃SiH₃ gas flow rate of 0 and 2 sccm. The Si-C Raman peak and Si-C stretching vibration in FT-IR can be observed at 605 cm⁻¹, which is generally well-known [refer to *J. Appl. Phys.* **2010**, 107, 023518]. However, in our case, the peak related to Si-C bonding was not observed; moreover, the spectra is almost same with as-grown SiNWs and Si_{1-x}C_x NWs.

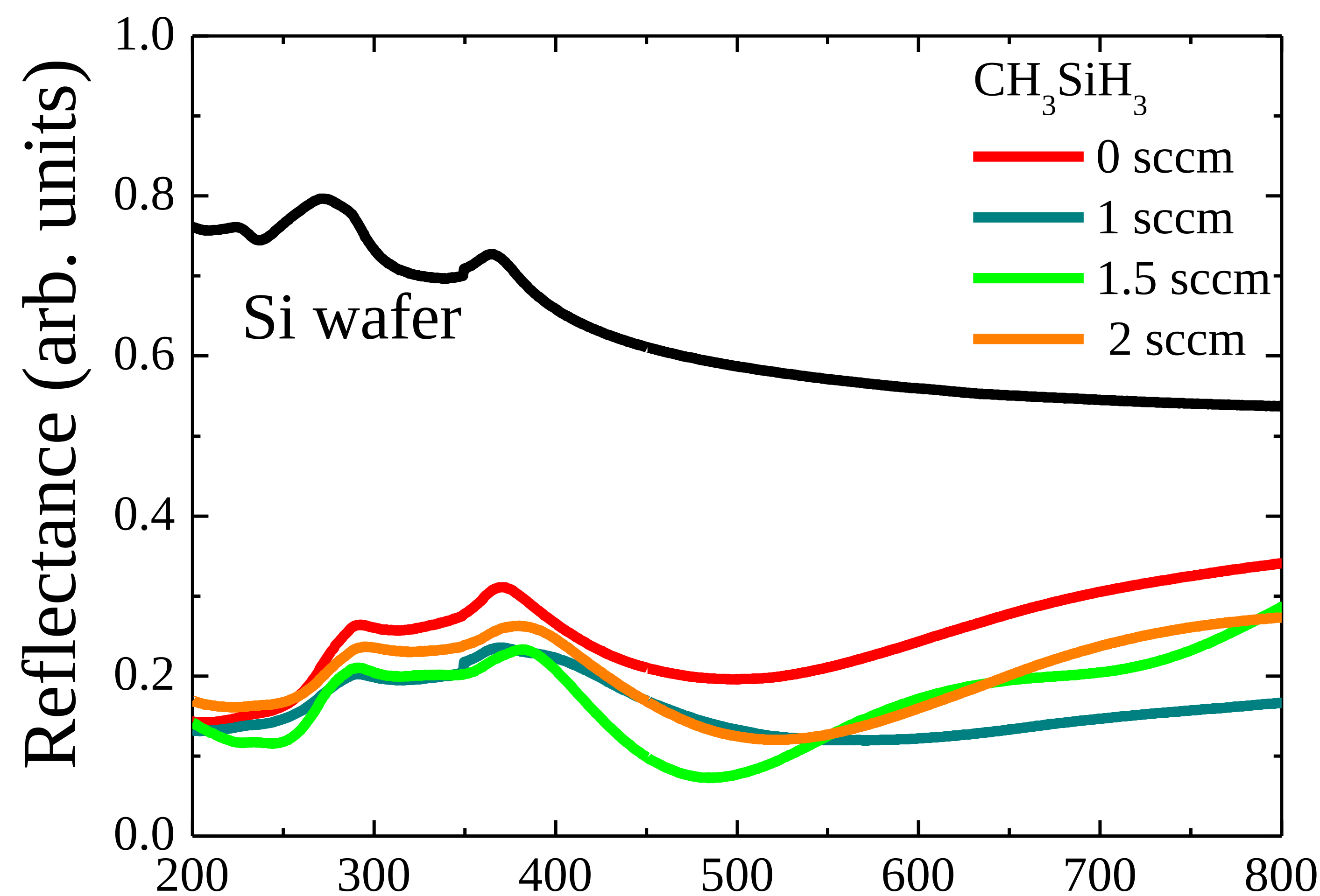


Figure S6. Reflectance spectra of a Si wafer and $\text{Si}_{1-x}\text{C}_x$ NWs depending on the CH_3SiH_3 gas flow rate obtained via UV-Vis spectrometry.

Supporting Figure S6. Lee *et al.*