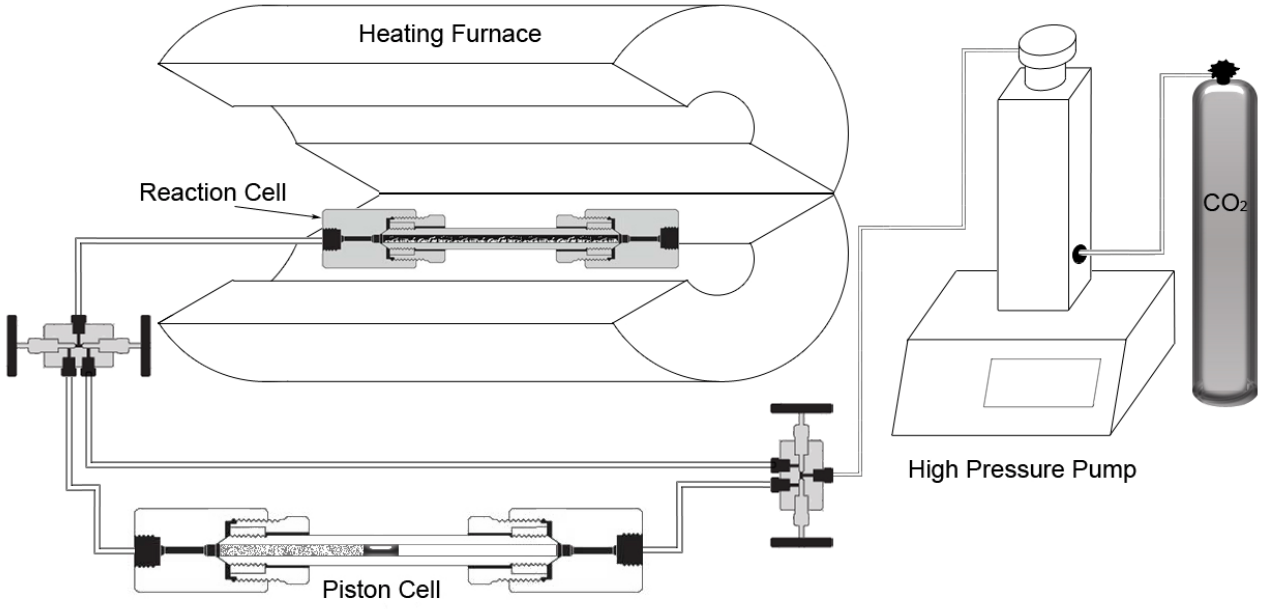
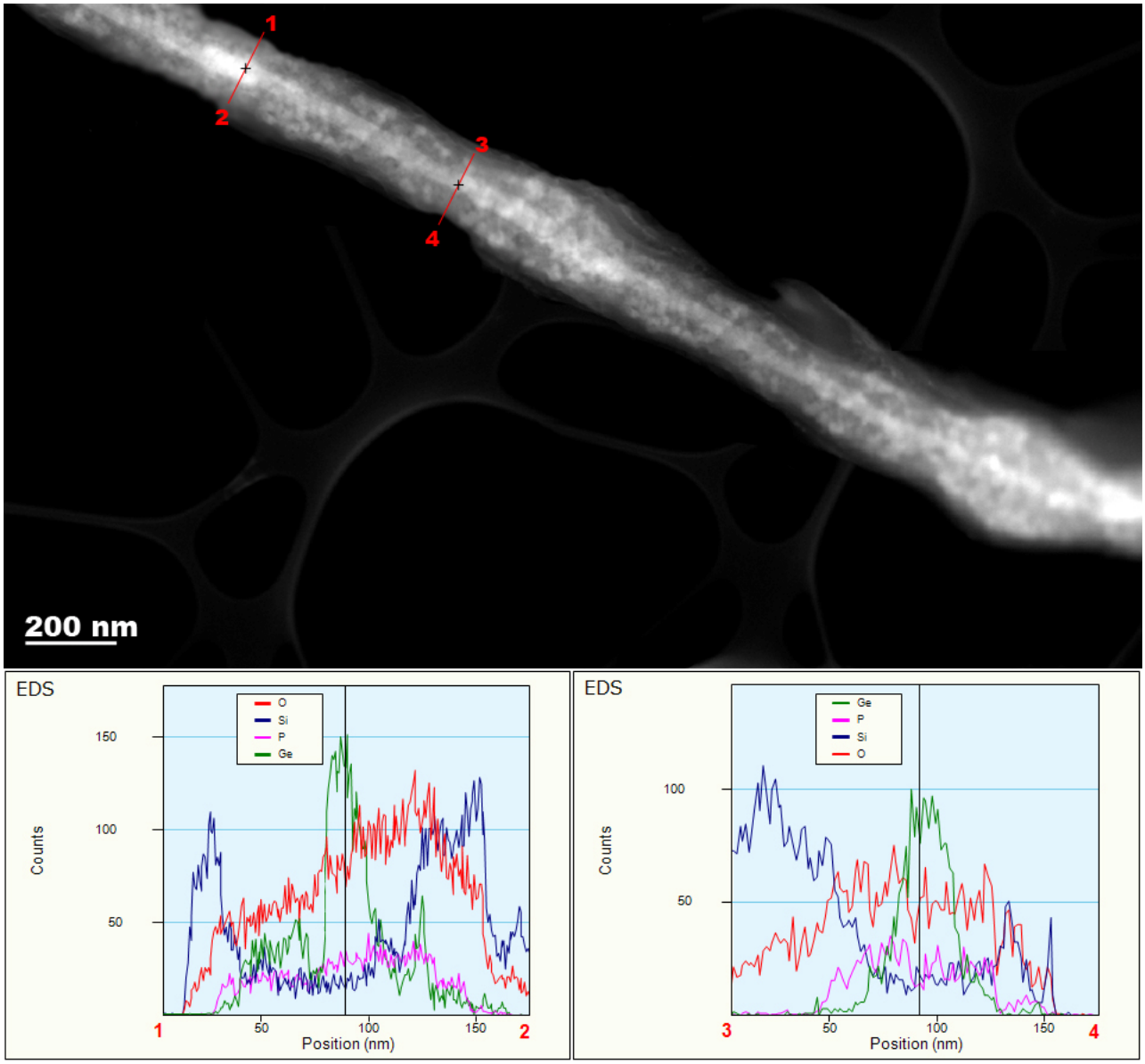
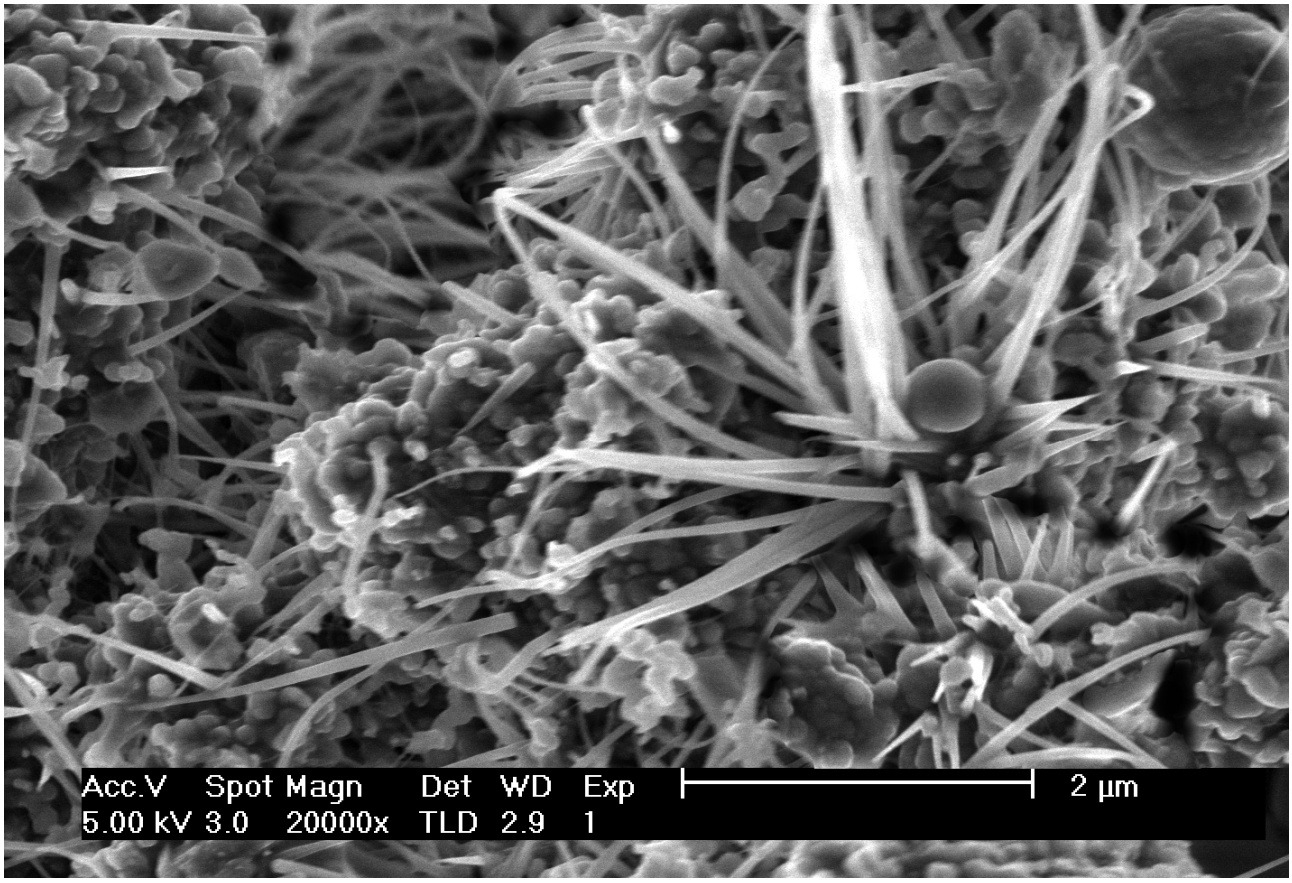


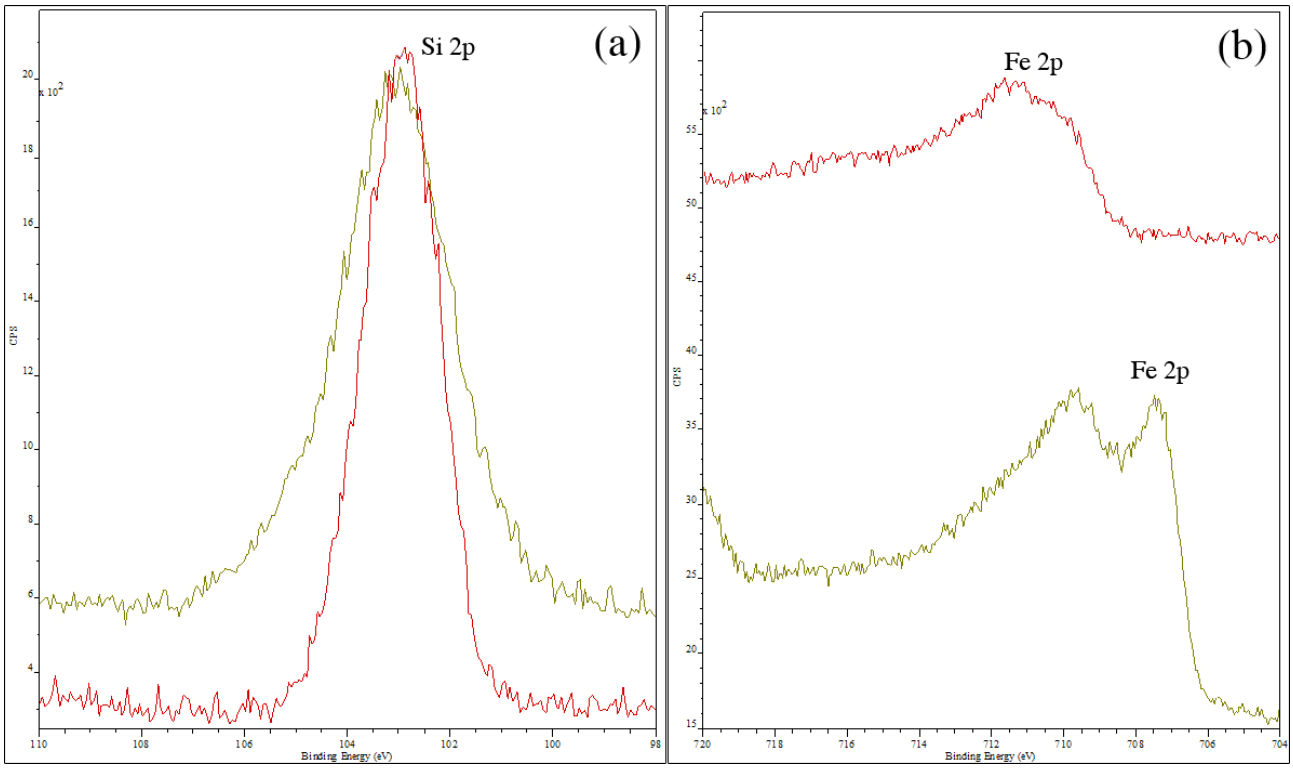
Supplementary Figure S1. A schematic outlining the set-up used for the synthesis of nanowires is shown in Figure 1a, where a high pressure pump is connected to either a stainless steel or titanium reaction vessel, which is placed within a three zone furnace.



Supplementary Figure S2. The HAADF-STEM image shows a Ge/SiO_x core-shell nanowire where line profile EDX analysis was carried out from points 1 to 2 and 3 to 4 respectively. The two EDX graphs shown display the spectroscopic data collected along both segments of the nanowire.



Supplementary Figure S3. The SEM image shown is from a steel substrate, removed from a reaction vessel after synthesis, where a high concentration of Si nanowire nucleation was observed. Higher densities of nanowires could be grown by increasing both the pressure and the precursor concentration of a typical synthesis.



Supplementary Figure S4. Shown above is the XPS data acquired from a stainless steel substrate removed from a reaction vessel after a typical synthesis of Si nanowires. Scans were carried out before (red line) and after 5 mins of Ar ion sputtering (green line), used to remove some surface carbon from the substrate. Initial scans found the Si 2p peak to be narrow, indicating one form of SiO_2. Analysis from the surface of the substrate found that the relative concentrations of iron were lower, compared to that of SiO_x, which uniformally cover the steel substrate. After sputtering the sample a new Fe 2p peak was seen in the spectrum and can be assigned to Fe_3Si. Since the concentrations were so small, the expected corresponding silicide peak could be buried within the larger Si peak. FWHM of the Si 2p was found to increase after sputtering which shows evidence that there are other forms of Si present (~10%) in addition to silica. The concentration of Si increased relative to C after sputtering, which would seem indicate that the subsurface is slightly enriched with Si.