

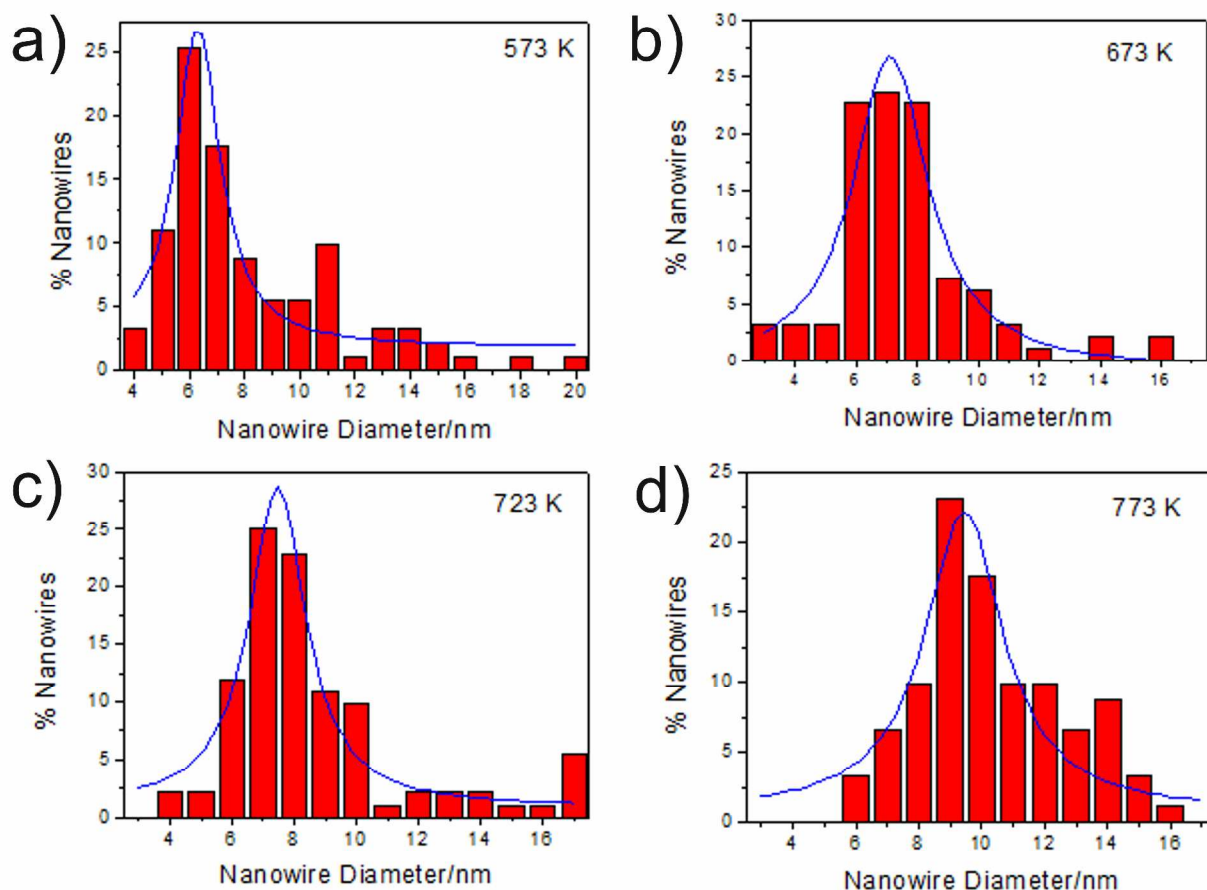
# Seedless Growth of Sub-10 nm Germanium Nanowires

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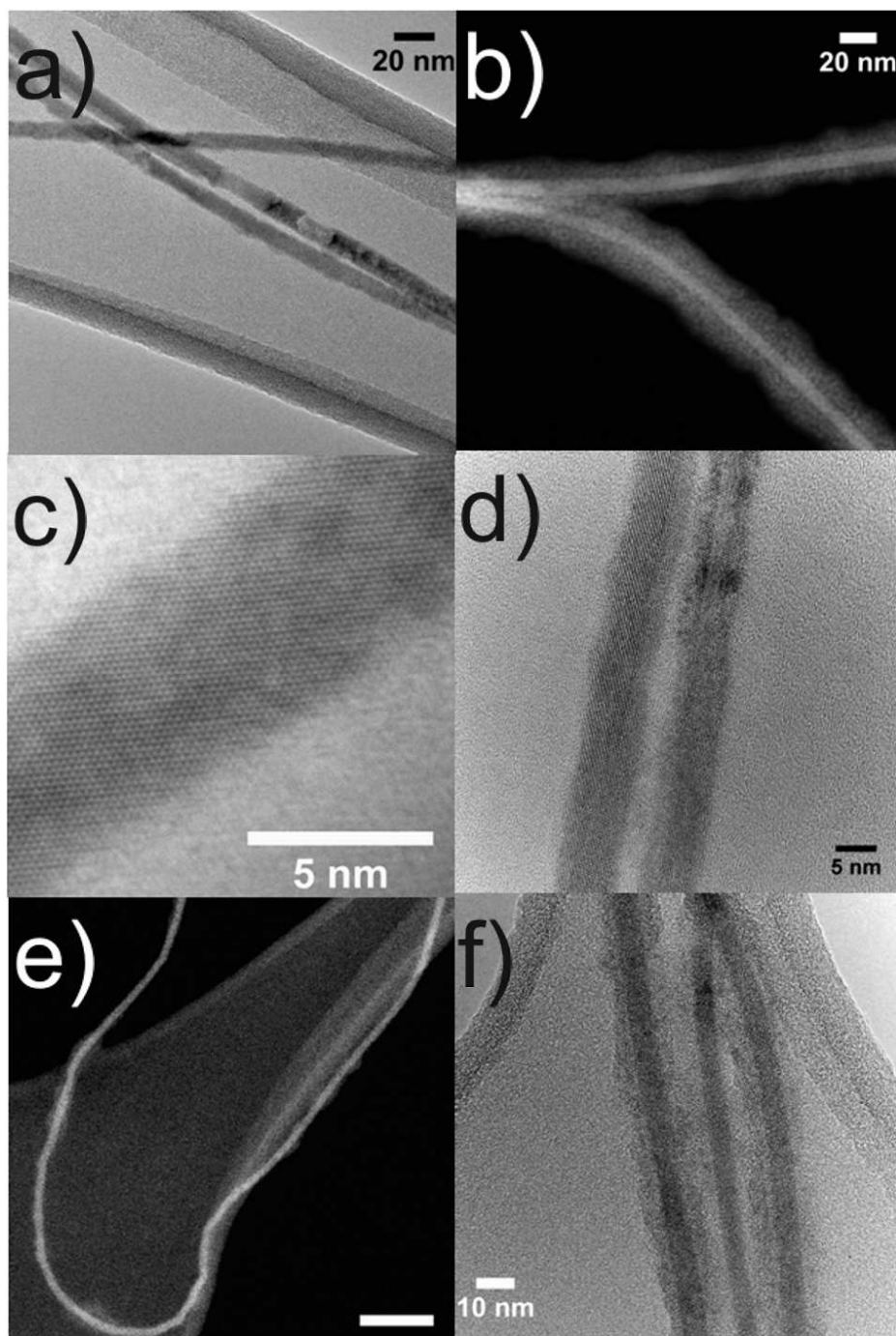
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**Table S1.** Synthesis time required to produce Ge nanowires from hexakis(trimethylsilyl)digermane in toluene.

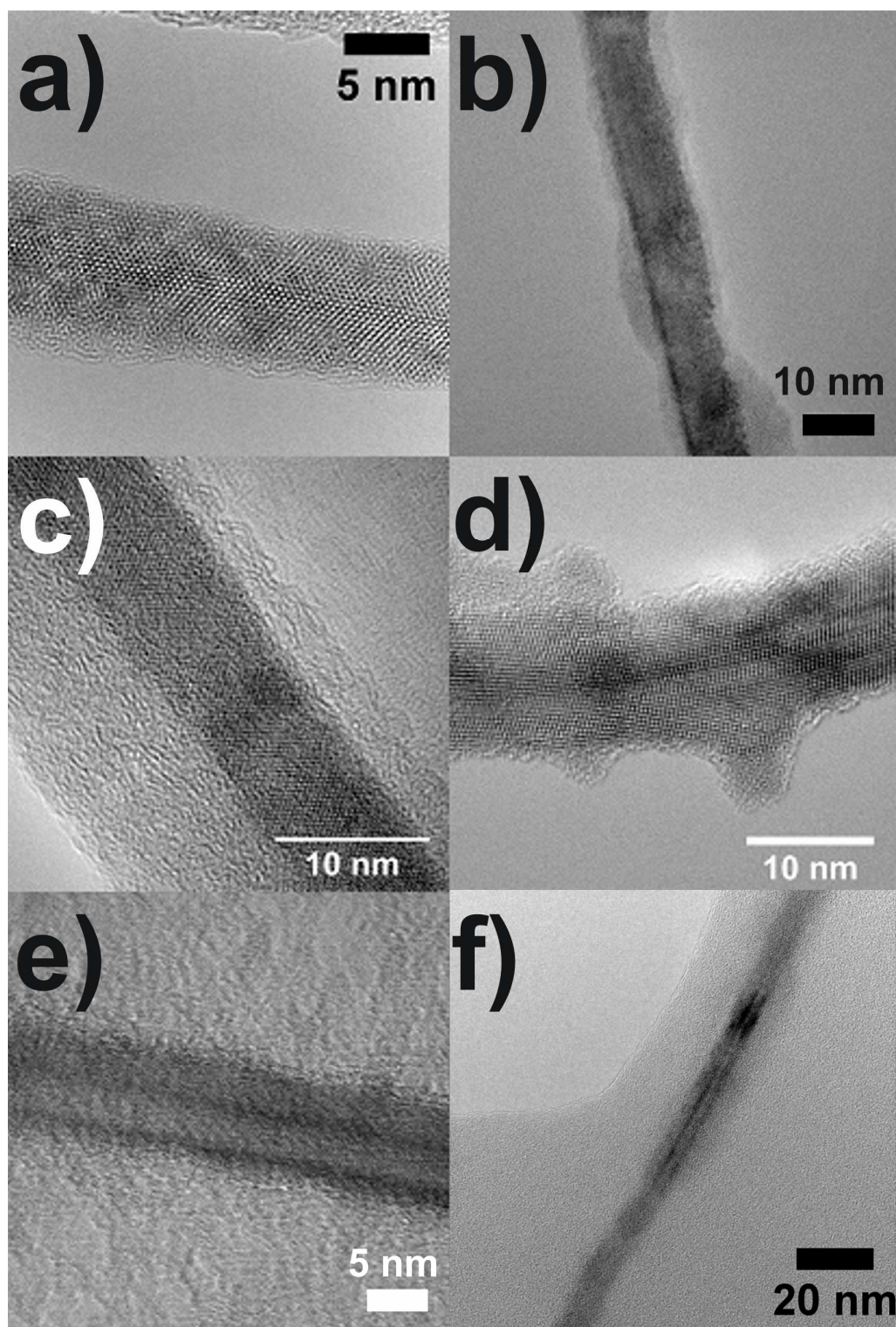
Synthesis Temperature (K)	Synthesis Time (h)
573	48
673	24
723	4
773	1



**Figure S1.** A plot of percentage of Ge nanowires measured against Ge nanowire diameter for synthesis temperatures of 573 K, 673 K, 723 K and 773 K. The blue trace represents a Lorentzian fit to the data. (a) 91 nanowires were measured by TEM. Lorentzian curve centred at 6.3 nm ( $R^2 = 0.90$ ) and has a FWHM of 2.0 nm. (b) 97 nanowires were measured by TEM. Lorentzian curve centred at 7.1 nm ( $R^2 = 0.91$ ) and has a FWHM of 3.0 nm. (c) 92 nanowires were measured by TEM. Lorentzian curve centred at 7.5 nm ( $R^2 = 0.93$ ) and has a FWHM of 2.2 nm. (d) 91 nanowires were measured by TEM. Lorentzian curve centred at 9.4 nm ( $R^2 = 0.86$ ) and has a FWHM of 3.0 nm.

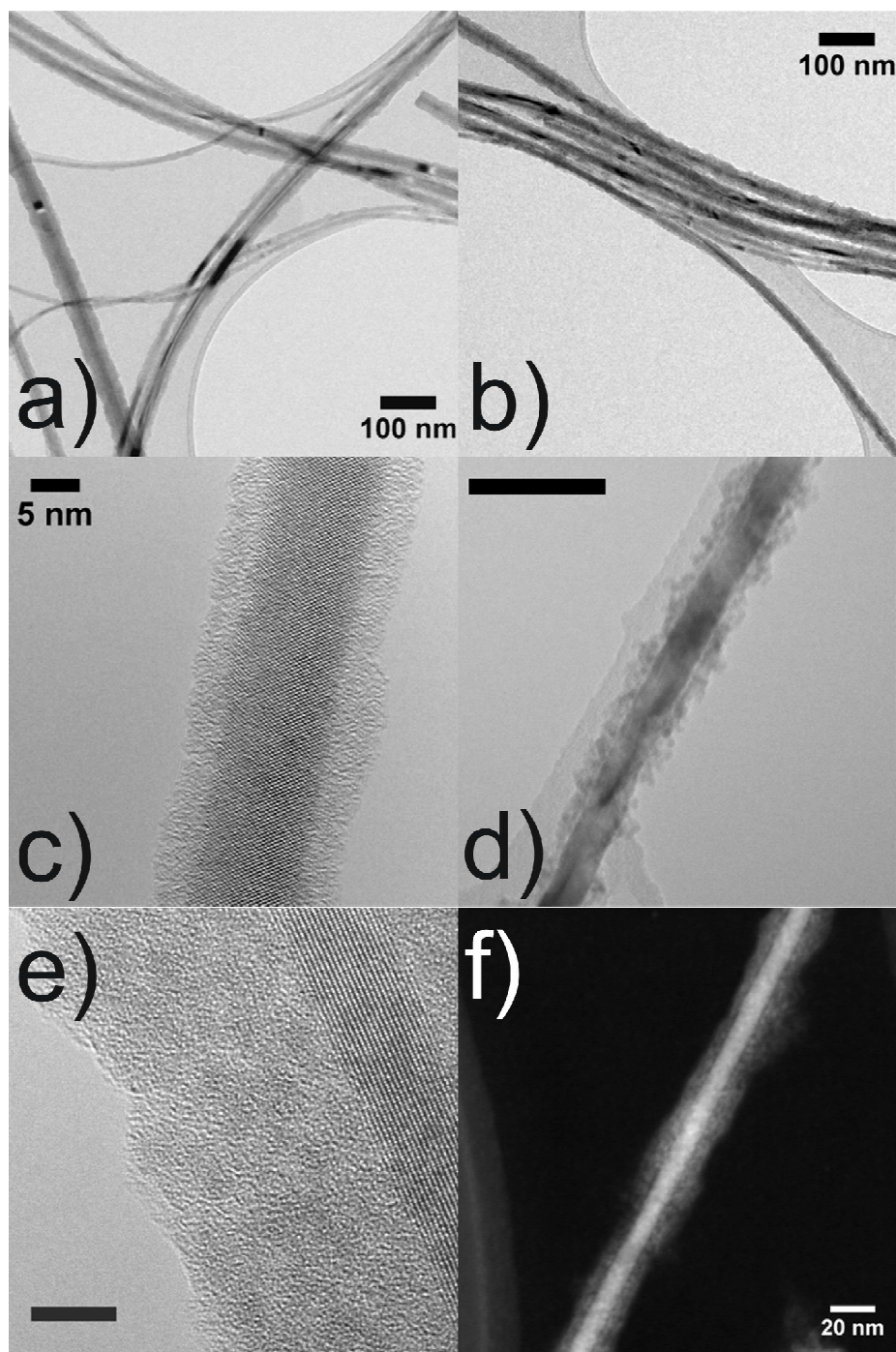


**Figure S2.** (a), (c), (d) and (f) bright field TEM micrographs of Ge nanowires synthesised at 300 °C. (b) and (e), HAADF STEM micrographs of Ge nanowires synthesised at 300 °C showing the Z contrast difference between the Ge nanowire core and the Si-based shell. Scale bar in (e) represents a length of 50 nm.

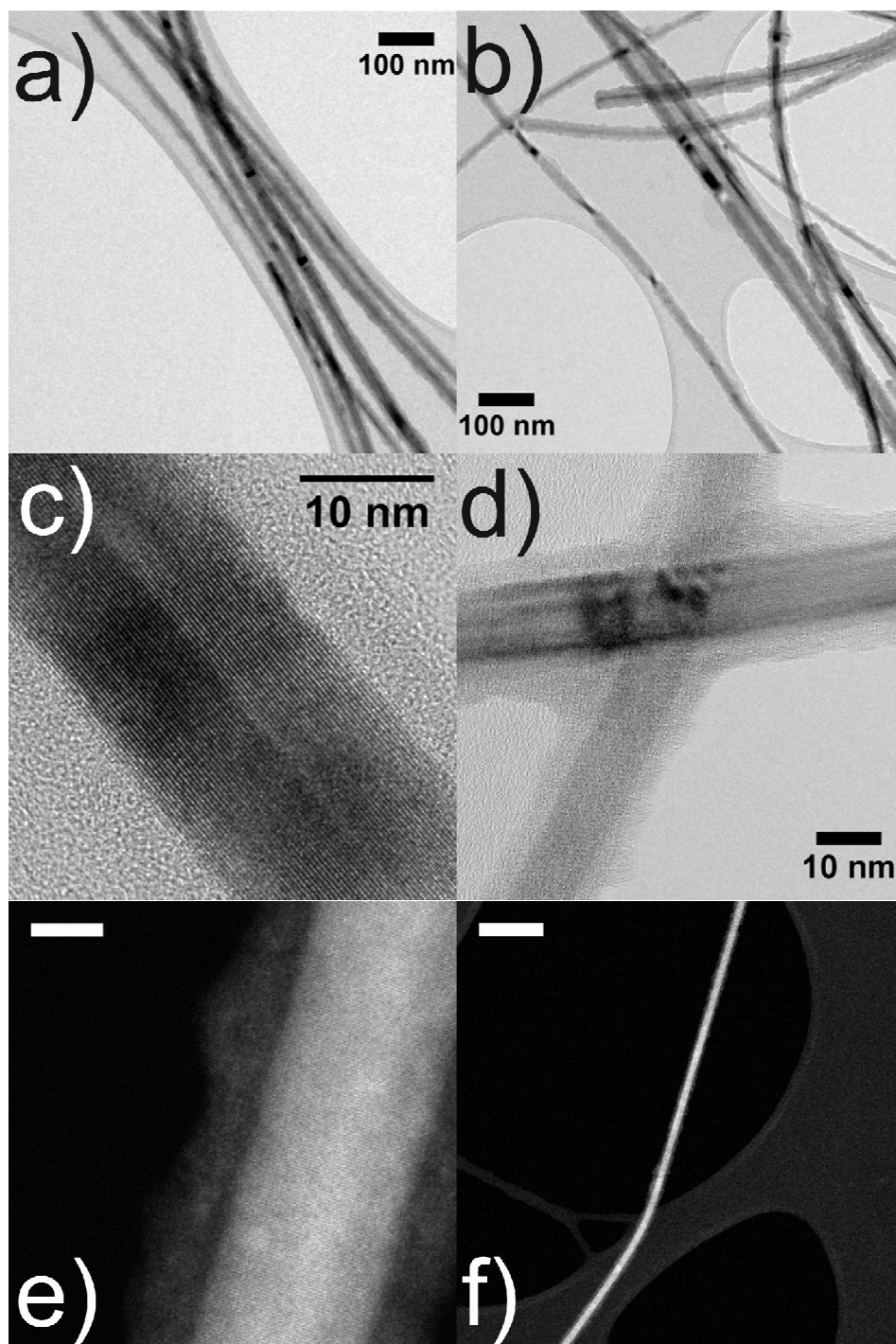


**Figure S3.** (a)-(f) Bright-field HRTEM micrographs of Ge nanowires synthesised at 400 °C.

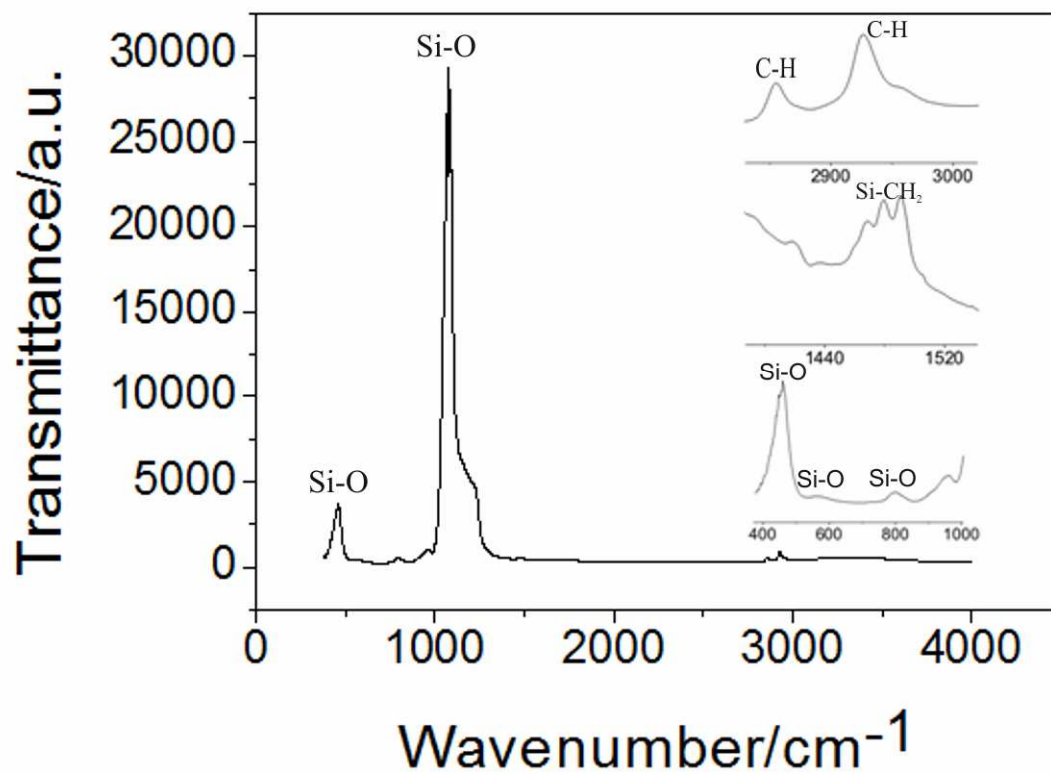




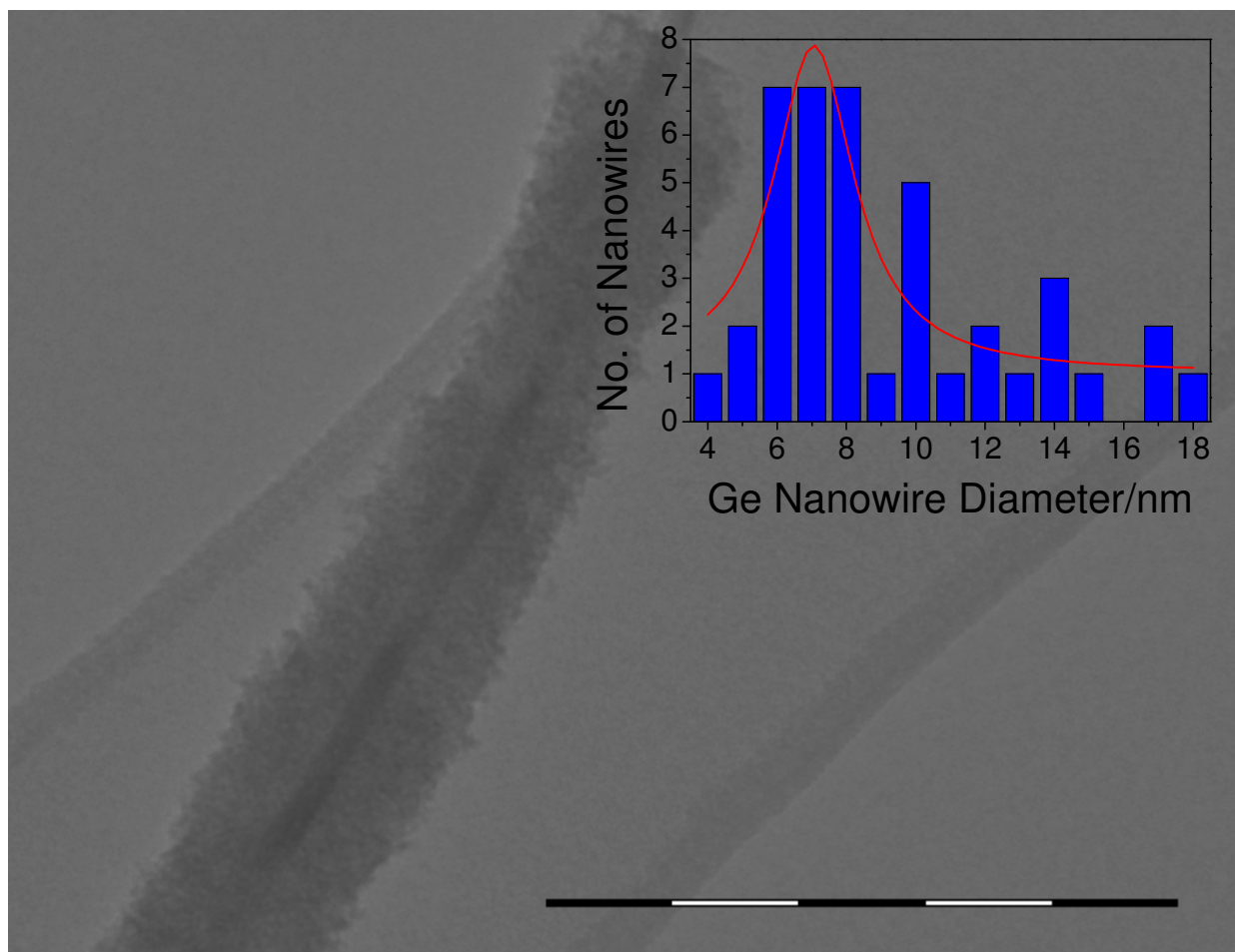
**Figure S4.** (a)-(e) Bright-field TEM micrographs of Ge nanowires synthesised at 450 °C. Scale bars in (d) and (e) represent lengths of 50 nm and 5 nm respectively. (f) HAADF STEM micrograph of a Ge nanowire synthesised at 450 °C showing the Z contrast difference between the Ge nanowire core and the Si-based shell.



**Figure S5.** (a)-(d) Bright-field TEM micrographs of Ge nanowires synthesised at 500 °C. (e) and (f) HAADF STEM micrographs of Ge nanowires synthesised at 500 °C showing the Z-contrast difference between the Ge nanowire core and the Si-based shell. Scale bars in (e) and (f) represent lengths of 5 nm and 100 nm respectively.

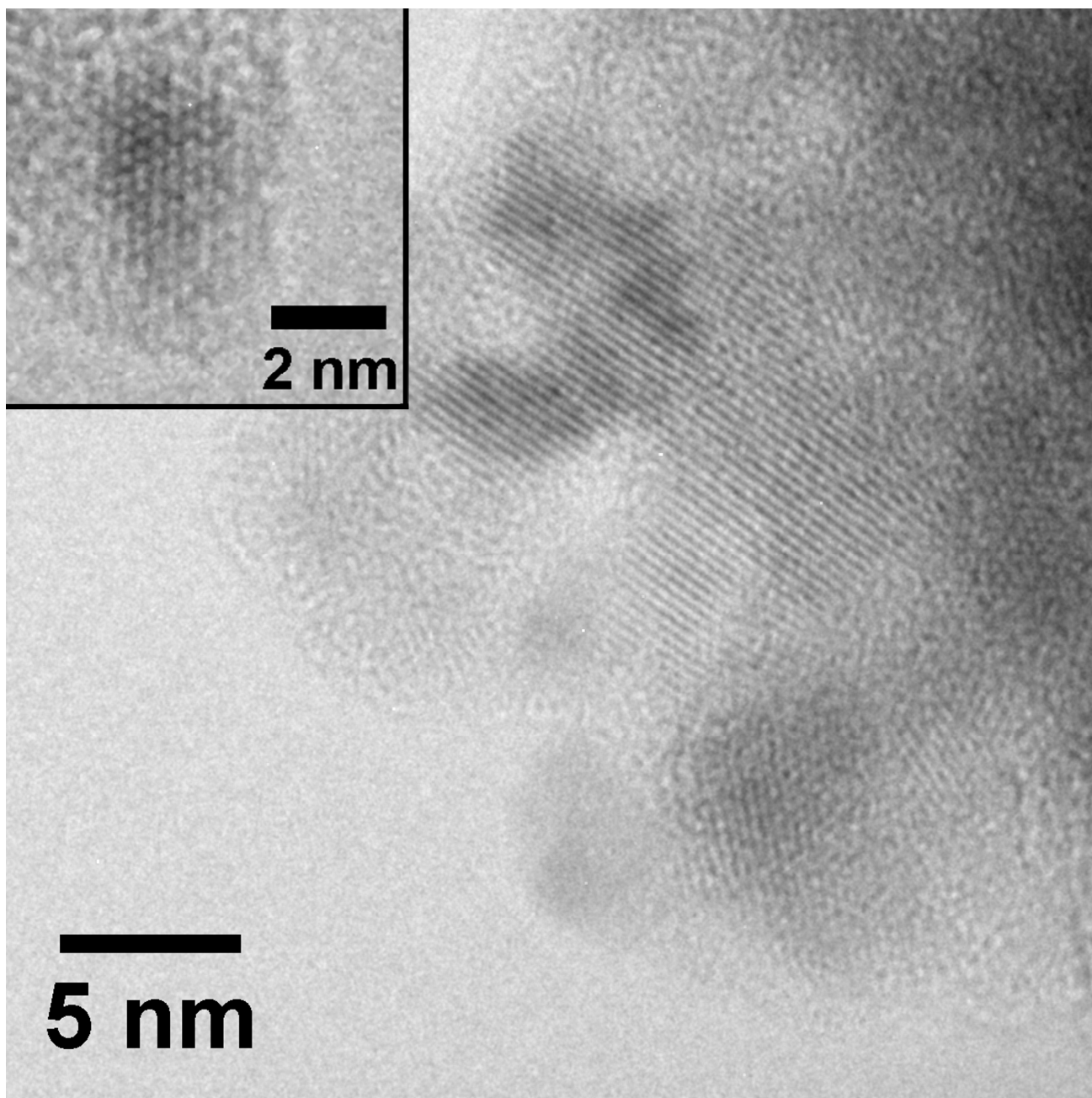


**Figure S6.** FTIR spectrum of a sample of Ge nanowires produced from  $\text{Ge}_2(\text{TMS})_6$  at 450 °C. Inset, magnified views of weaker absorption bands.



**Figure S7.** A TEM micrograph of a typical nanowire produced from  $\text{Ge}(\text{TMS})_3$ . Scale bar represents a length of 200 nm. Inset, is a bar graph showing the observed diameters of the crystalline Ge nanowire cores as measured by TEM.





**Figure S8.** Ge nanoparticles within a Si-based matrix. The nanoparticles were collected from a precursor solution which was heated to 300 °C for 24 h and quench cooled in liquid nitrogen. Inset, a HRTEM micrograph of a 3 nm diameter Ge nanoparticle within the Si rich matrix material.