Supplementary Information for 'Synthesis of Silicon-Germanium Axial Nanowire

Heterostructures in a Solvent Vapor Growth System using Indium and Tin Catalysts



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Figure S1: Low magnification SEM image showing seed/NW diameters for a) Sn seeded Si NWs and b) Sn seeded Ge NWs synthesized in the SVG system



Figure S2. a) Low and b) higher magnification SEM of In seeded Si NWs showing an average seed/NW diameter ratio of ≈ 3.75 :1 c) Low and d) higer magnification of In seeded Ge NWs showing a seed/NW diameter ratio of ≈ 1.7 :1.



Figure S3. a) XRD of In seeded Si/Ge heterostructure NWs on SS showing peaks indexed for In, Si, Ge, In_2O_3 and SS (substrate). b) DFSTEM image of two In heterostructure NWs highlighting the 3 NW components. c) DFSTEM of NWs in b) imaged in COMPO mode to give more topological information d) A higher magnification image of the area highlighted in c). The oxidised In surface is roughened in appearance.



Figure S4. a) DFSTEM image of Sn seeded Si/Ge heterostructure NW and corresponding EDX linescan highlighting the 3 nanowire components in b)



Figure S5. SEM analysis of In catalyzed Si/Ge HNWS with a) Si reaction time of 60 minutes followed by a Ge reaction time of 2 minutes. b) A Si reaction time of 30 minutes followed by a Ge reaction time of 10 minutes.



Figure S6. a) Low magnification SEM image of In seeded Ge NW by-product formed in the solution phase of the reaction flask during an In heterostructure reaction. b) A higher magnification SEM image of In seeded Ge NWs showing the seed/NW diameter and morphology. c) An EDX line scan showing signals for the In seed and Ge NW region of the NW highlighted in the DFSTEM image in d).



Figure S7. a) SEM of Bi seeded Ge on SS. b) XRD of Bi seeded Ge NW showing intensities for Bi, Ge and the underlying SS substrate