

Supplementary information
Lattice dynamics of $\text{Ge}_{1-x}\text{Sn}_x$ alloy nanowires

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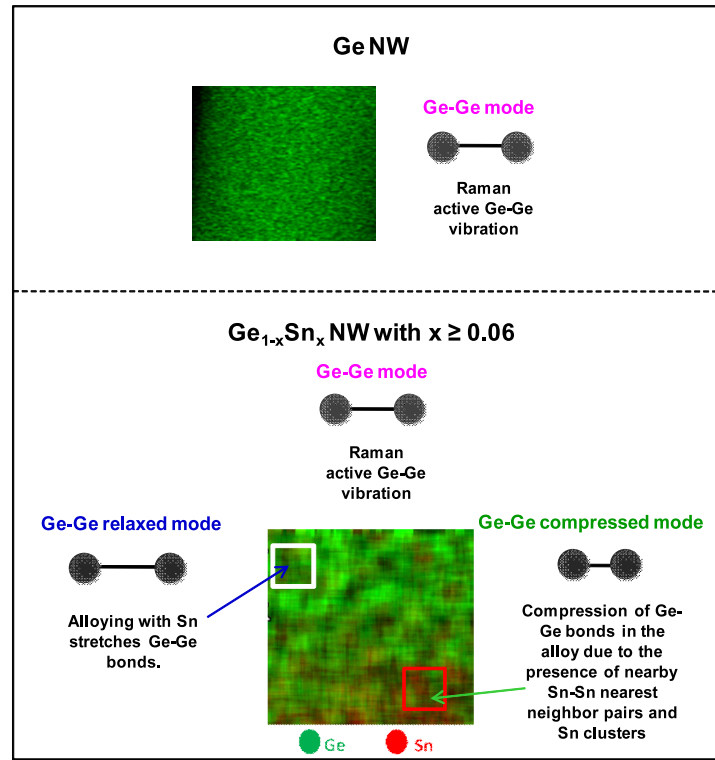


FIG. S1. Schematic diagram representing all Raman modes of Ge and $\text{Ge}_{1-x}\text{Sn}_x$ NWs with $x \geq 0.06$ correlated to representative elemental maps.

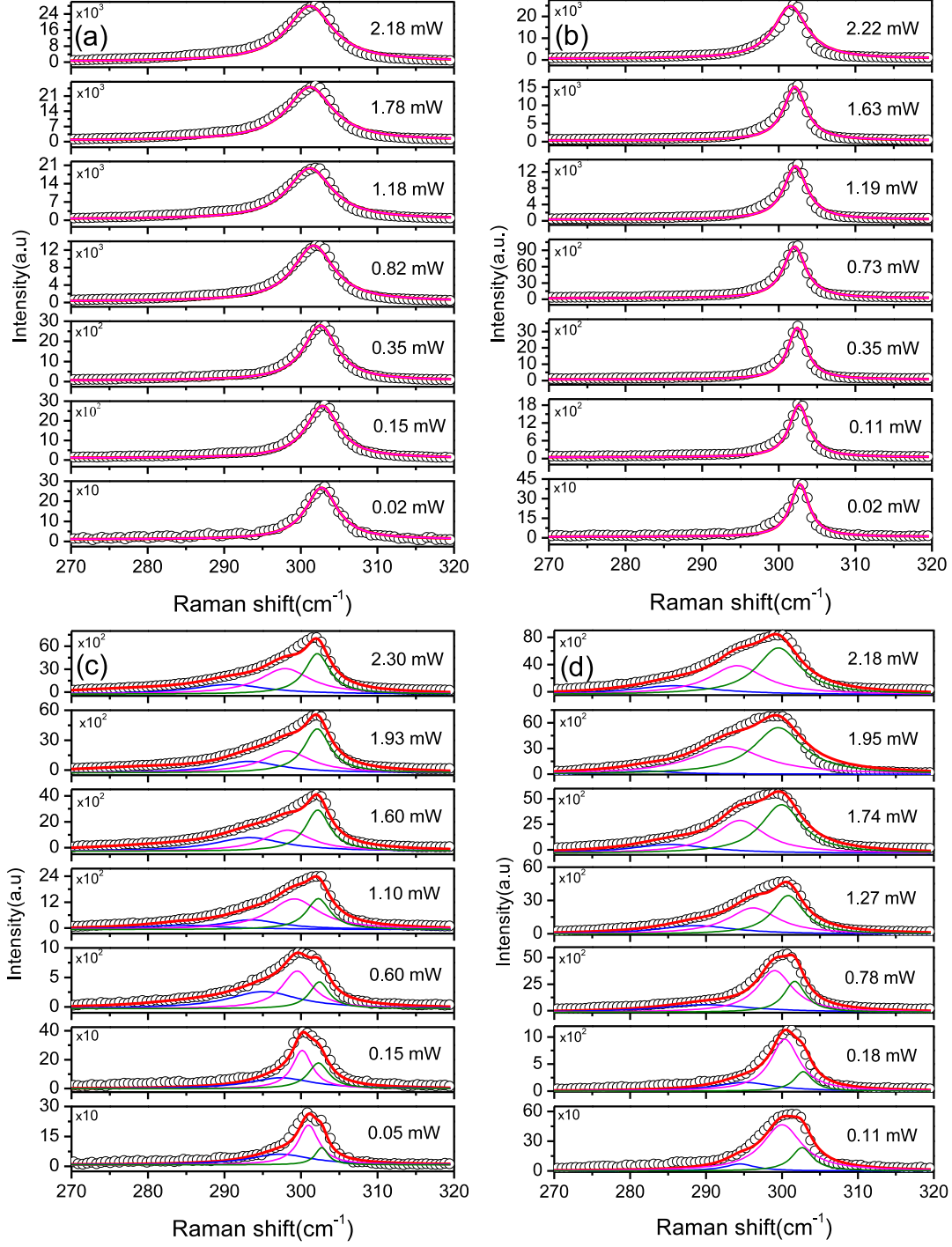


FIG. S2. Raman spectra [discrete points are the experimental data and red solid curve represent the fitted spectra] of $\text{Ge}_{1-x}\text{Sn}_x$ NWs with (a) $x = 0$, (b) $x = 0.01$, (c) $x = 0.06$, (d) $x = 0.08$ measured at various laser powers (0.02 mW to 2.30 mW). Each spectrum is fitted with Lorentzian functions where magenta, blue and green solid curves represent Ge-Ge F_{2g} mode, Ge-Ge relaxed mode and Ge-Ge compressed mode respectively.

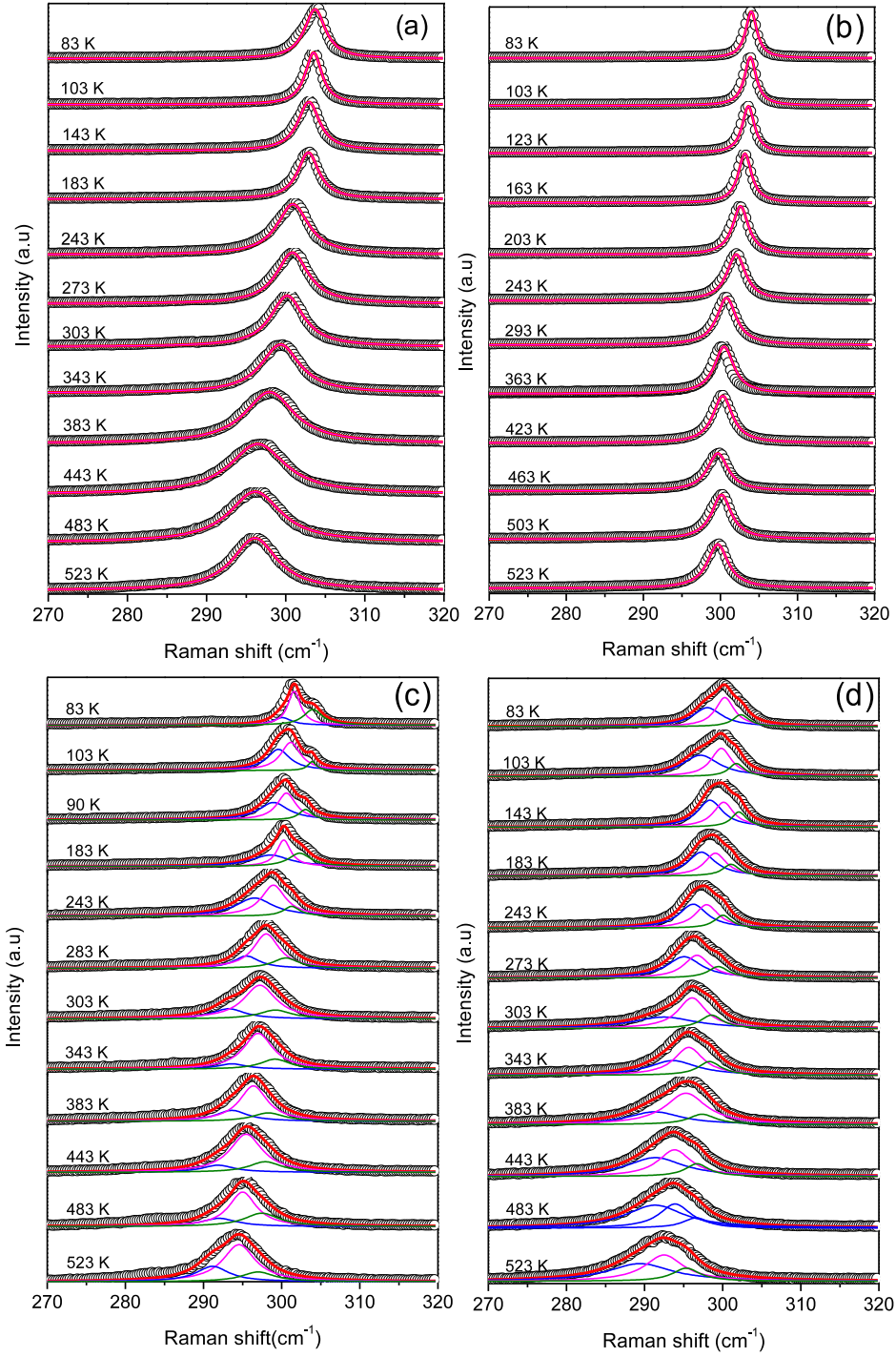


FIG. S3. Raman spectra [discrete points are the experimental data and red solid curve represent the fitted spectra] of $\text{Ge}_{1-x}\text{Sn}_x$ NWs with (a) $x = 0$, (b) $x = 0.01$, (c) $x = 0.06$, (d) $x = 0.08$ measured at various temperatures (83 K to 523 K). Each spectrum is fitted with Lorentzian functions where magenta, blue and green solid curves represent Ge-Ge F_{2g} mode, Ge-Ge relaxed mode and Ge-Ge compressed mode respectively.