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Raman Scattering from $\text{Si}_{1-x}\text{Ge}_x$ Alloy Nanowires QI-
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University — Bulk $\text{Si}_{1-x}\text{Ge}_x$ crystals can be prepared over a wide com-
position range $0 < x < 1$. These materials are of interest because alloying
can be used to vary the bandgap of the system. Here we present Ra-
man scattering results on $\text{Si}_{1-x}\text{Ge}_x$ nanowires ($0 < x < 1$) grown by the
vapor-liquid-solid growth mechanism using a Chemical Vapor Deposi-
tion (CVD) approach. TEM and XRD were used to characterize the
morphology growth axis and lattice constant of these materials. Typical
wire diameters were observed to be in the range 80-130 nm. Based on
Raman scattering studies of the bulk, three Raman bands are expected
that can be identified as a perturbed Si-Si ($\sim 500 \text{ cm}^{-1}$) mode, a Ge-Ge
($\sim 280 \text{ cm}^{-1}$) mode or a new mode at ($\sim 390 \text{ cm}^{-1}$) assigned to Si-Ge or
Ge-Si clusters. Peaks in this region are also observed in the case of our
nanowires, although the frequencies are a few cm^{-1} lower than observed
in the bulk. We also observe that the compositional (x) dependence of
the Si-Ge band in nanowires is somewhat different than in the bulk.

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