

Course Video Questions - Phonons

- Part I: Phonon Fundamentals: Name the two phonon modes exist in a phonon dispersion relation for a diatomic linear chain of atoms.
- Part II: Phonon Scattering and Impurity Scattering in Extrinsic Semiconductors: Write down the mathematical relationship of the temperature dependence proportionality for mobility (i.e., $\mu \propto f(T)$ where you need to provide $f(T)$) for the following two scattering mechanisms: (1) phonon scattering, & (2) impurity scattering.
- Part III: Local Vibrational Modes: In order to observe a local vibrational mode, does the mass of the impurity atom need to be larger or smaller than the mass of the matrix atom? Provide a one sentence explanation.
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