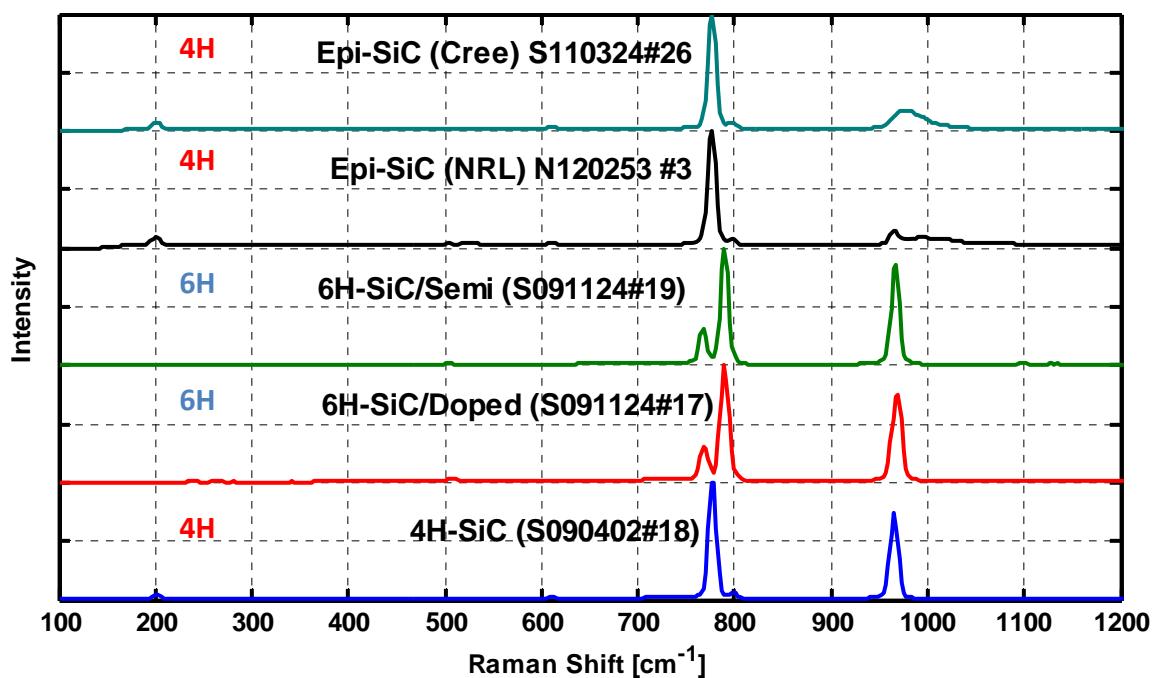


# Polytypes of SiC

SAND2012-9949P



## Summary:

- The polytypes of SiC are different in their spectral character because of the differences in their phonon dispersion.
  - 6H has three distinct modes that allow for it to be clearly identifiable.
  - 4H has 2 prominent modes and one mode of lesser intensity.
- LO phonon-plasmon coupled modes change with free carrier concentration
  - Blueshift and broaden with increasing concentration (See Figure from Harima JAP 78 1996 1995).
- Takeaways:
  - For both samples, substrate SiC is 4H (assuming thin epitaxial layer/How thick?)
  - Sample from NRL has either a more highly crystallized epitaxial region (see sharp LO mode) or more low doped epilayer.

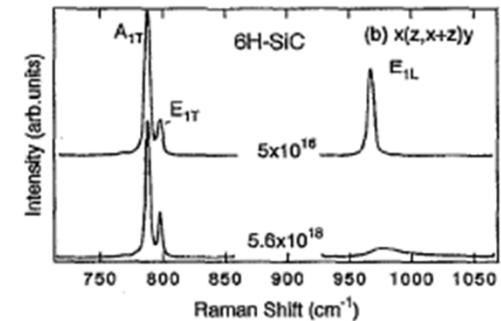
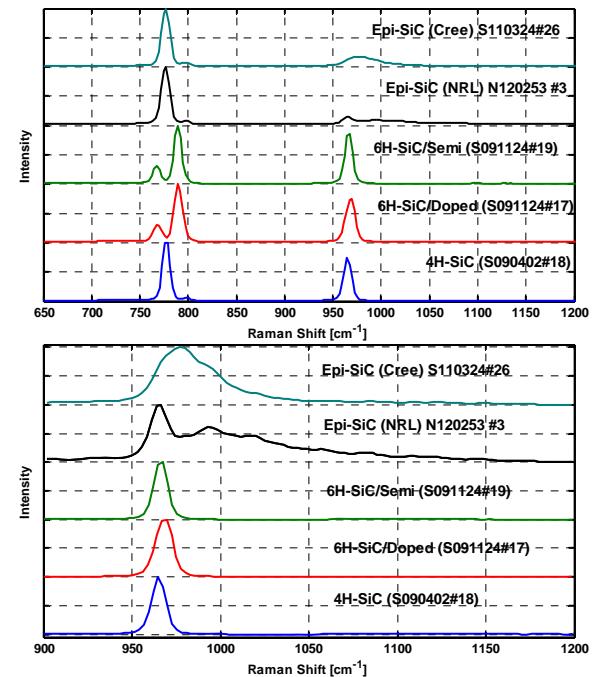


FIG. 4. Raman spectra of 6H-SiC with different carrier concentrations observed in (a) backscattering and (b) right-angle scattering geometries.

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