

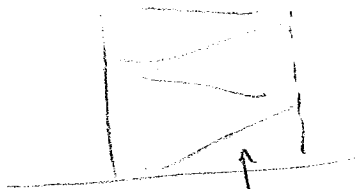
20131 11)

How to determine where Fermi level is

Example w/ Si band structure (handout)

Si = diamond structure \rightarrow 2 atoms / prim. cell

4 valence electrons / atom \rightarrow 8 electrons / prim. cell.

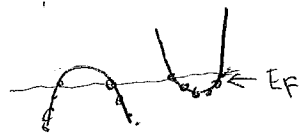
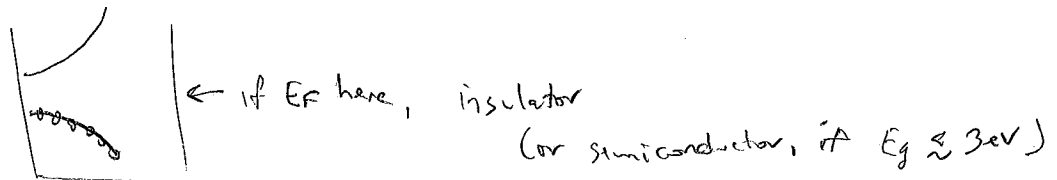
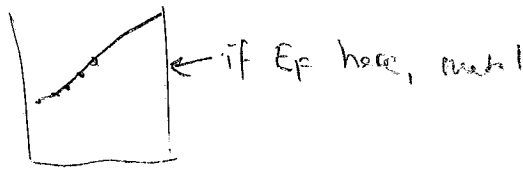


each band fills up with $2N$ electrons (including spin)

\therefore lowest 4 bands = filled

(careful w/ degenerate bands, though)

Metals vs insulators - Where is Fermi Energy?



semimetal

(Ex: Bismuth, Arsenic, Antimony)

Not many states for electrons

to jump into.

Perturbation theory part
(Nearly Free Electron)

- covered steps 1, 2, 3 + 8/9