



**MATERIALS SCIENCE
& ENGINEERING**
TEXAS A&M UNIVERSITY

Introduction to Materials Science & Engineering

Optical Absorption

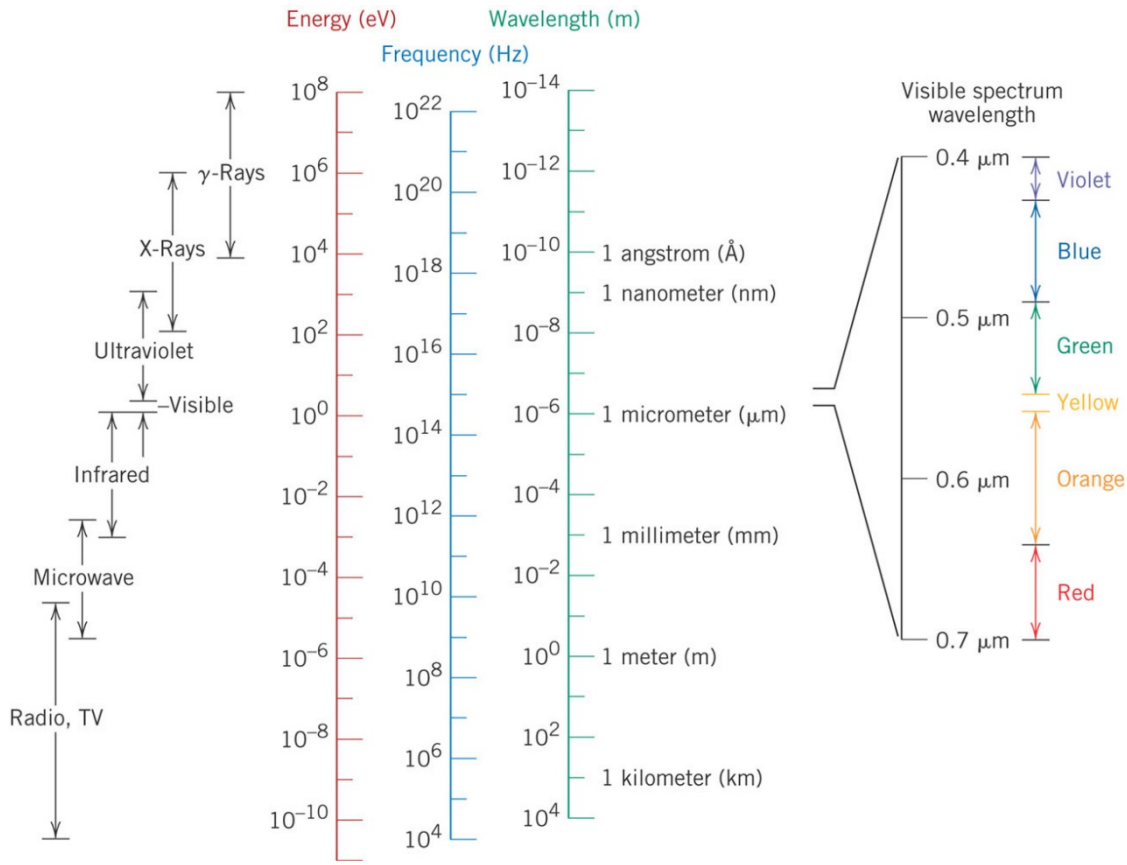
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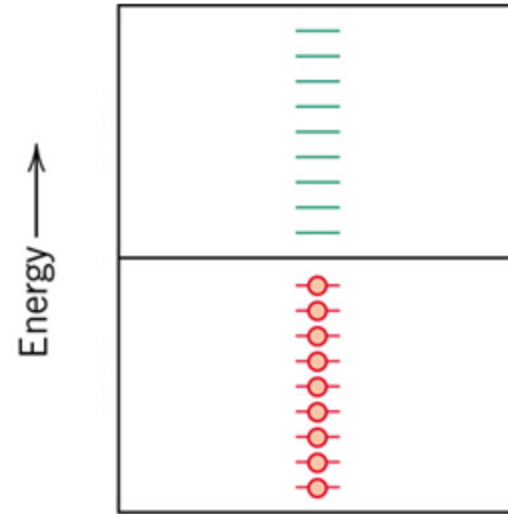
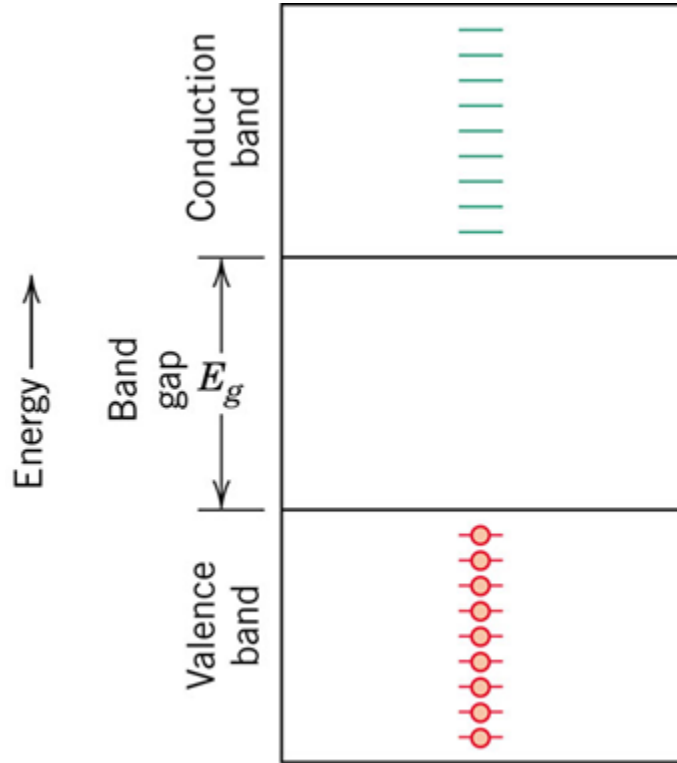


Light & Matter

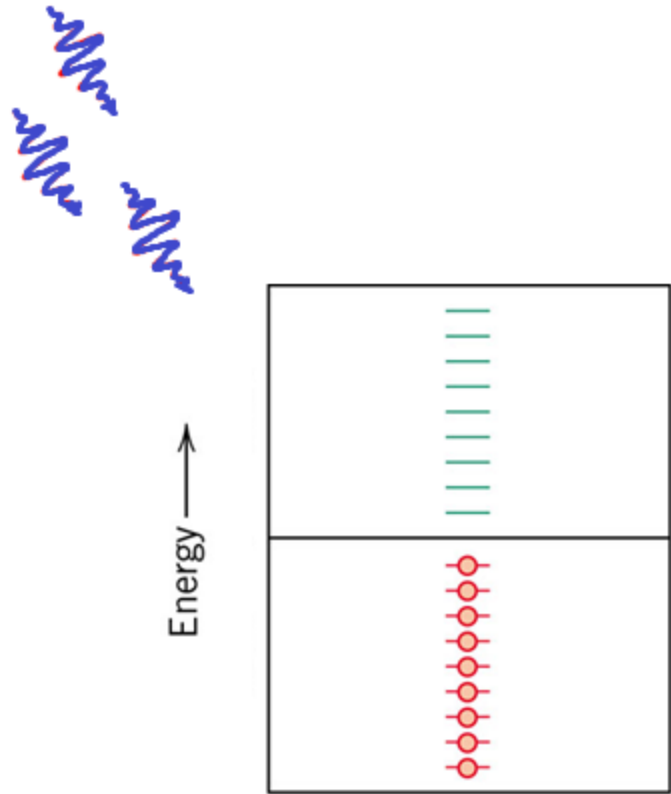


$$E = h\nu = \frac{hc}{\lambda}$$

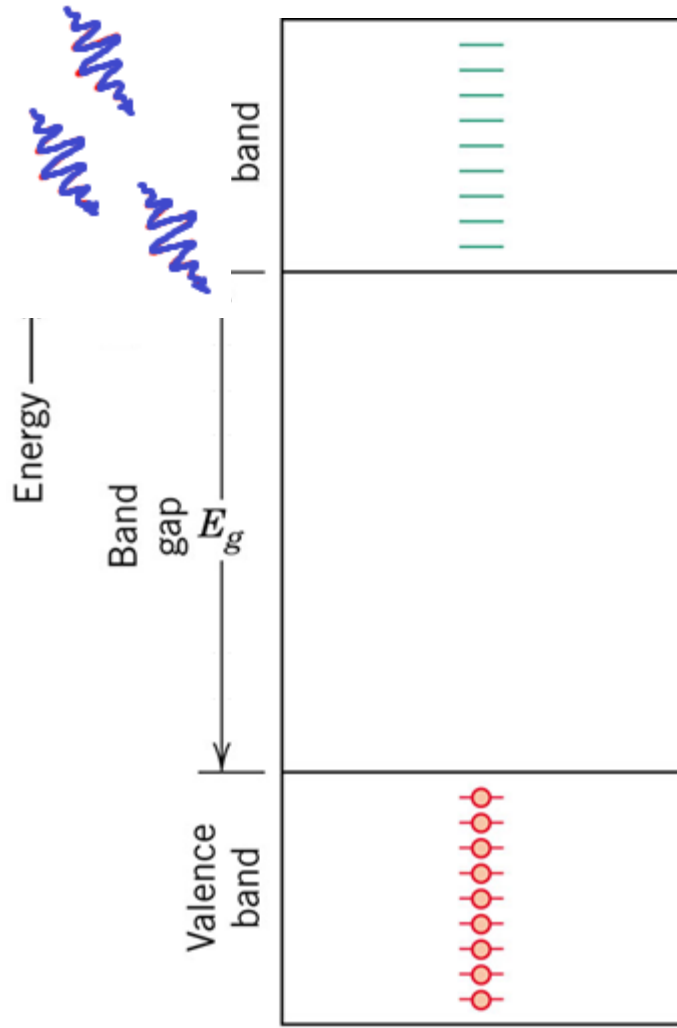
Electronic Band Structure: Review



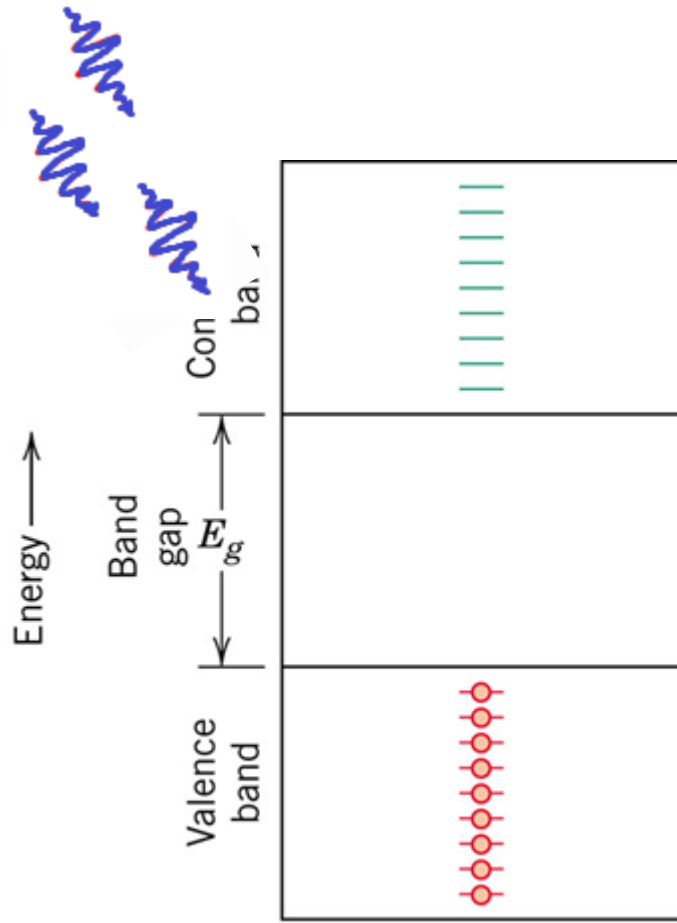
Metals: Opaque/Absorption



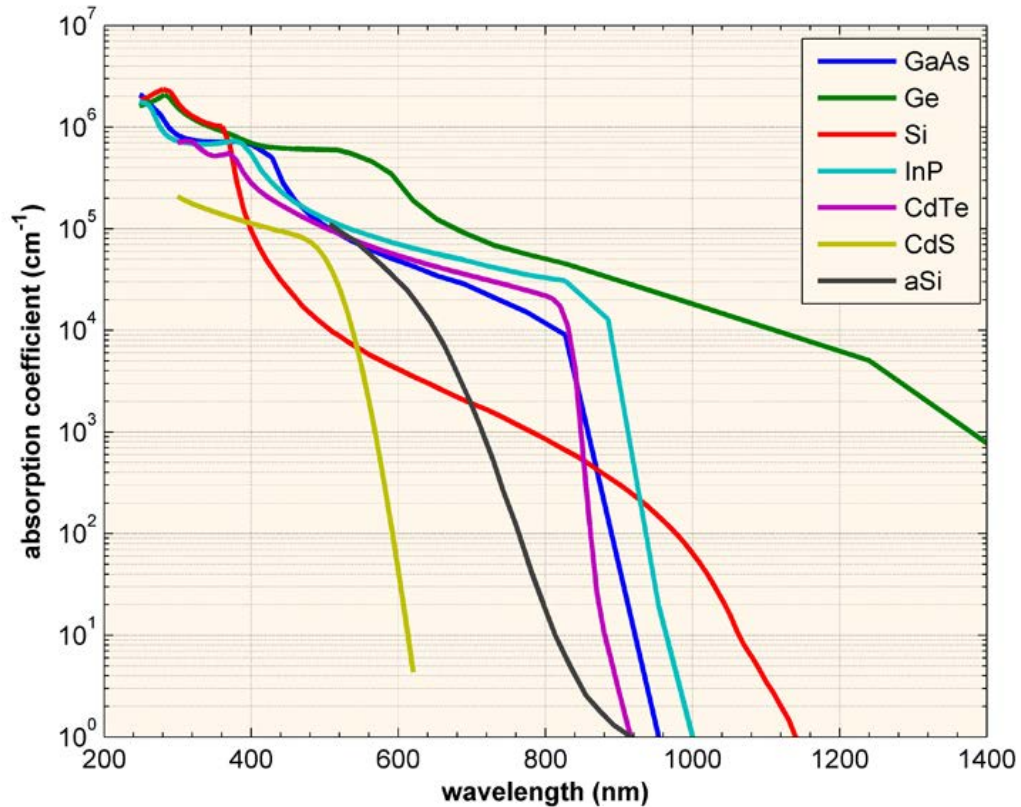
Insulators: Transparent



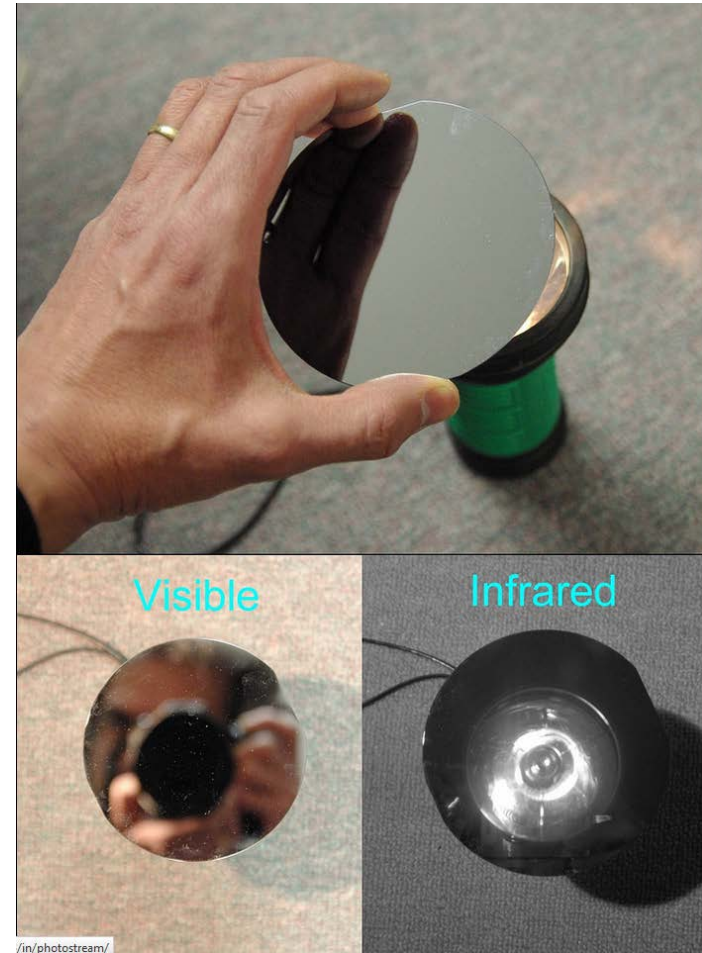
Semiconductors: Semi-Transparent



Absorption vs. Wavelength



<http://pveducation.org/pvcdrom/pn-junction/absorption-coefficient>



/in/photostream/

Summary

- Photons of light associated with a specific energy
- To “absorb” a photon, there must be an available energy level to accept the excited electron
- Metals = absorptive
- Insulators = transparent
- Semiconductors = selectively transparent