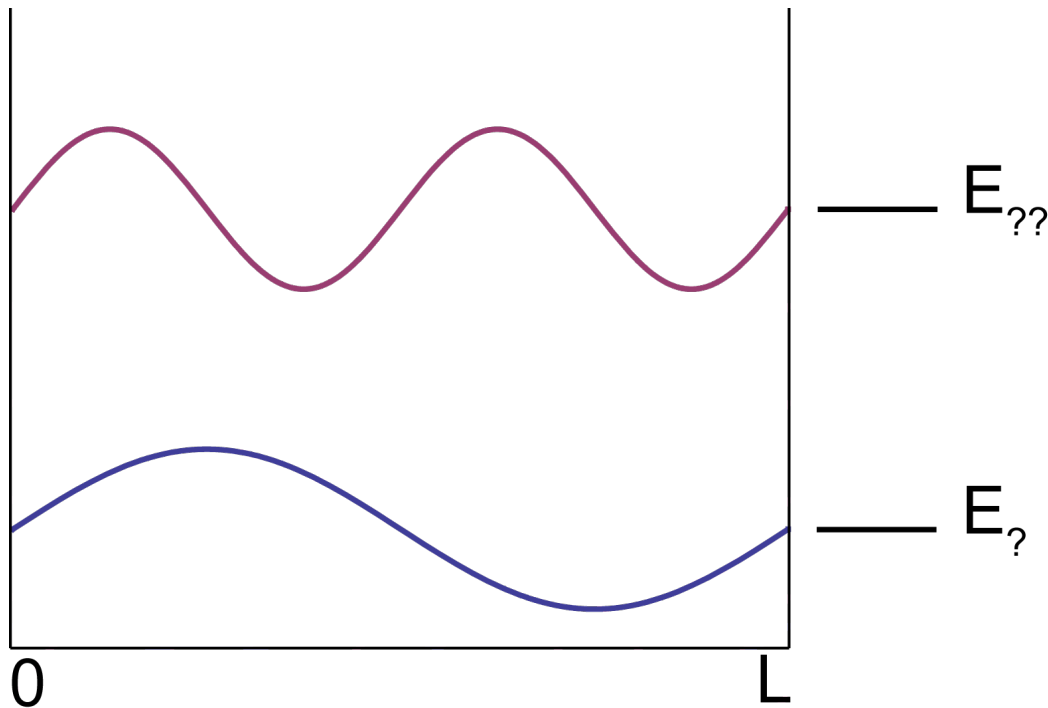


Chem H₂A Review

Midterm 1

PIAB



$$\psi(x) = \left(\frac{2}{L}\right)^{1/2} \sin\left(\frac{n\pi x}{L}\right)$$
$$E_n = \frac{n^2 h^2}{8mL^2}$$

What are the values on “n” for the two wavefunctions?

What is the difference in energy?

Atomic Spectroscopy

H emission spectrum (in nm)



Can you determine the initial and final state for each emission?

Quantum Numbers

- What are the values of m_l for a p orbital?
- What are the number of values of l for any given n ?
- What are the possible values for m_s ?
- How many states are there for $n = 2$?
- What type of subshell is the state $|3,1,0,-1/2\rangle$?

Term Symbols

Consider an excited state with the configuration $2p^13p^1$

$$2S+1L_J$$

- What are the possible values of **S**?
- What are the possible values of **L**?
- What are the possible values of **J** for **L=1**?

Photons

- What is the energy (in eV) of a red, 633 nm laser? ($1\text{eV} = 1.609 \times 10^{-19} \text{ J}$)
- What is the workfunction of a metal that emits an electron($9.109 \times 10^{-31}\text{kg}$) at $4.522 \times 10^5 \text{ m/s}$ when an argon laser (454nm) shines on it?
- What is the wavelength of a proton moving at a speed of $1.533 \times 10^4 \text{ m/s}$?

