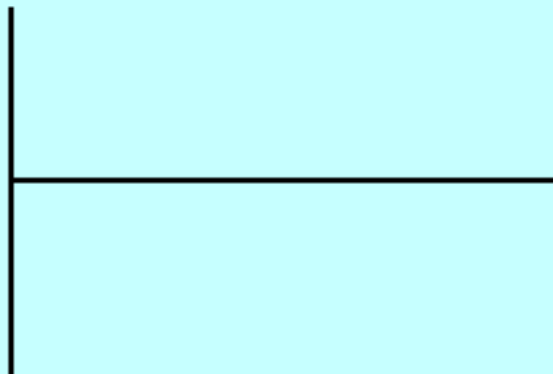


Chapter 5 ~ Atomic Spectra

When you excite electrons \rightarrow you inc E \rightarrow given off as heat & LIGHT

-speed of light = 3.0×10^8 m/s = c

-formula = ν \Rightarrow Electromagnetic Radiation



Explaining the Atomic Spectra:

-based on Bohr's quantum theory

-states lowest E state/level = Ground State

--> $n = 1$ ~ go to $n = 2, 3, 4, 5, 6$ when excited

--> E levels quantized through $h \cdot \nu$ (to raise the state)

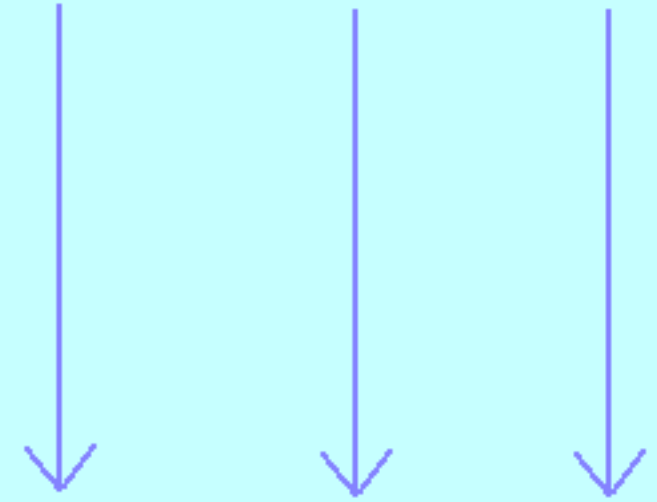
1926: Schrodinger - Quantum Mechanical Model

Data: Study of Light emitted from elements

1) Light can be described as a form of wave energy called Electromagnetic Radiation

2) waves have wavelength & frequency

3) Electromagnetic Radiation includes a broad spectrum of radiant energy ...

Waves	λ	ν	E
	<i>Long</i>	<i>Low</i>	<i>Low</i>
Radiowaves			
Radar			
Microwaves			
Infrared			
Visible Light			
Ultraviolet			
X Rays			
Gamma Rays			
Cosmic Rays			

4) speed of wave = (wavelength)(frequency)

5) speed of light = constant = _____

6) Energy is directly proportional to frequency

$$E = h \cdot \nu$$

$$h = 6.626 \times 10^{-34} \text{ J}\cdot\text{s}$$

h = Planck's Constant



The electron configuration of electrons around the nucleus of atoms was determined by studying the light energy emitted by elements when they are heated/electrified. The light energy given off is called **ATOMIC SPECTRA**

Symbol	Unit(s)	Definition
Speed of Light <i>(constant)</i>	c	distance per time (rate of light travels at)
Wavelength	λ	distance between crests
Frequency	ν	number of wave cycles to pass a point per unit of time

c is a constant in a vacuum!

(wavelength) x (frequency) = speed

$$\lambda \cdot \nu = c$$

λ & ν are inversely proportional

<http://jersey.uoregon.edu/vlab/elements/Elements.html> - select an element and click "emission" at the top of the chart; when you click on one of the bands you'll get the wavelength

<http://www.800mainstreet.com/spect/emission-flame-exp.html#procedure> among other items and links, there are simulated flame tests and emission spectra for selected metals