

## Chapter 6 – Electronic Structure of Atoms

How do you find wavelength?

Does red light or blue light have a longer wavelength?

A laser used in communication systems emits radiation with a wavelength of 550.0 nm. Calculate the frequency of this radiation.

What is Planck's constant?

Calculate the energy of one photon of blue light that has a wavelength of 450 nm.

What is the wavelength of an electron moving with a speed of  $2.50 \times 10^6 \text{ m/s}$ ? The mass of the electron is  $9.11 \times 10^{-31} \text{ kg}$ .

A positive  $\Delta E$  means energy is \_\_\_\_\_.

A negative  $\Delta E$  means energy is \_\_\_\_\_.

**Quantum Numbers:**

Group 1A – 2A:

Group 3A – 8A:

Transition Metals:

Inner Transition Metals:

\_\_\_\_ = principal quantum number

\_\_\_\_ = magnetic quantum number

\_\_\_\_ = angular momentum number

\_\_\_\_ = spin quantum number

\_\_\_\_\_: No two electrons can have the same energy

\_\_\_\_\_: Electrons will fill atomic orbitals of lower energy before filling higher energy orbitals.

\_\_\_\_\_: Orbitals with the same sublevel will be half-filled before electron pairing occurs.

**Practice Problems: Electronic Configuration**

Ca

S

Mn

Cl<sup>-</sup>

Cs<sup>+</sup>

Write the condensed electron configuration for copper

**Exceptions:**

Ag

Au

What would be the quantum numbers ( $n$ ,  $l$ ,  $m_l$ ,  $m_s$ ) for selenium's last electron?