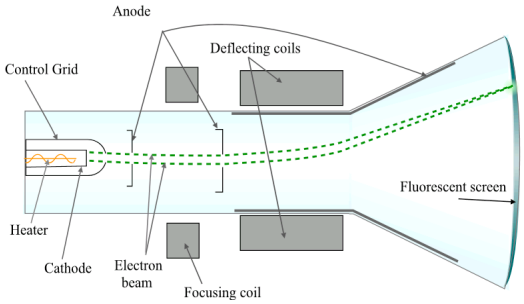
Electrons: Bringing the Negativity, one Particle at a Time: Ch. 5



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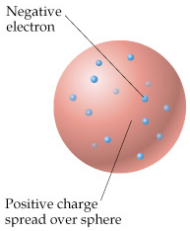

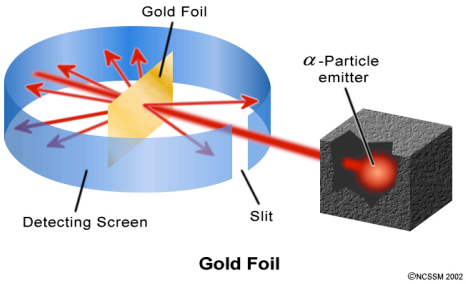

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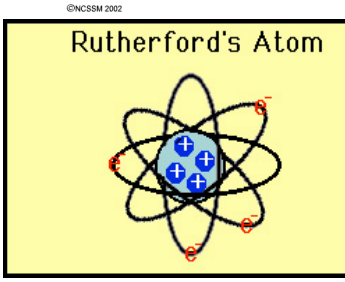


I. Background

A. Review: Atomic Models

1.

2.

B. First, a bit about light...

1. Light has

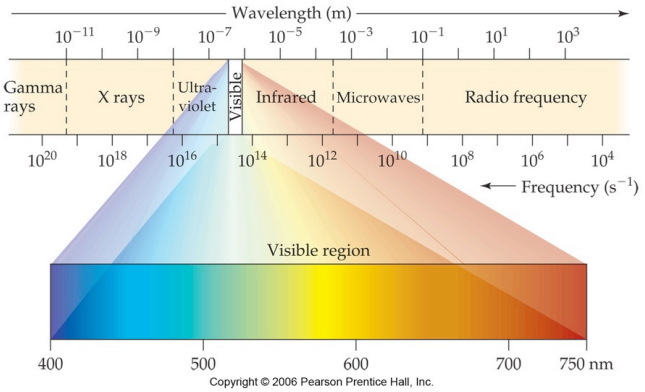
2. A wave has two important characteristics:

a.

b.

C. The Electromagnetic Spectrum (p. 120)

Weakest (long)



Strongest (short)

1.

2.

D. But sometimes,

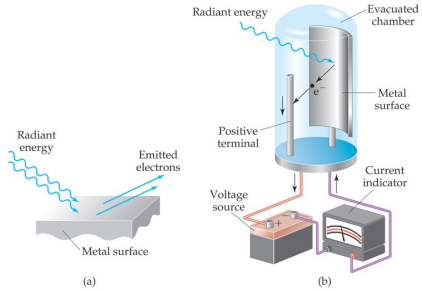
1.

2.

a. Certain colors are emitted by certain metals.

3. Thus, light also has (known as)

E. Thus,



II.

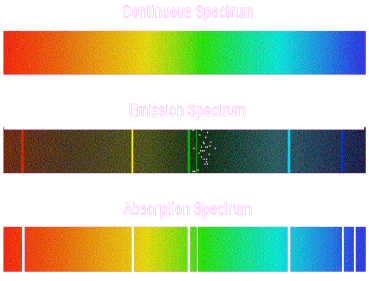
A. Bohr found that

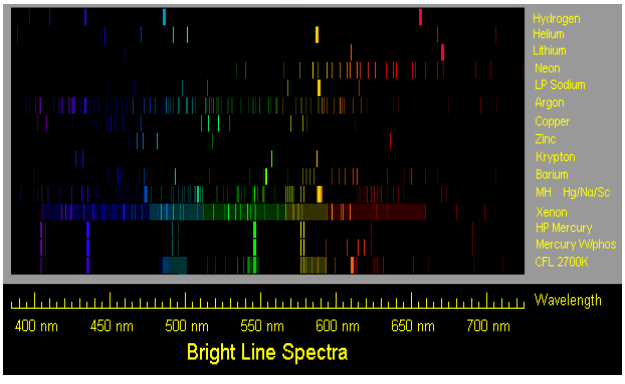
B. He concluded that electrons exist on

C. This only works for hydrogen.

D. Line spectra of various elements:

E. How Bohr Found His Model...





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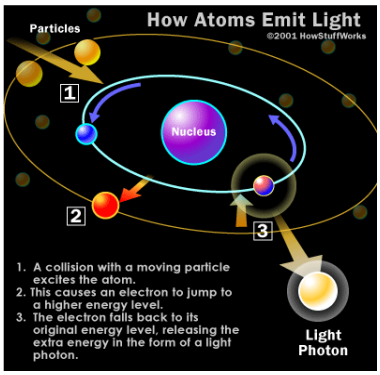
F.

1. Electrons by the
2. When they

3. Because



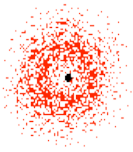
III. Quantum Models

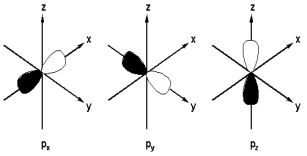
A.

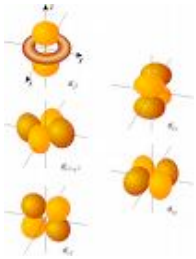
1. Probability and Orbitals
   a.

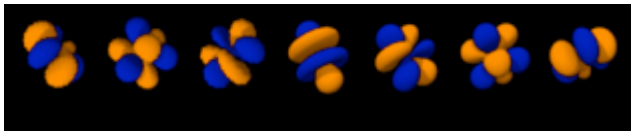
   b. These orbitals predict
   c. There are 4 types of orbitals.

Orbital	**Shape**	**# of suborbitals**	**max # e-'s**


a 1s orbital







B.

1. Using orbitals, we can give electrons an "address."
2. Your map is the
3. Orbitals:

4. The number in front of the orbital type is also known as the

5. How to write Electron Configurations
   a. Locate the element (on the periodic table)

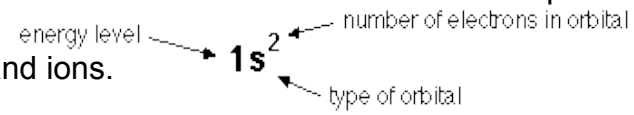
   b. Calculate the amount of electrons the element has (one box=one electron).

      ii. NOTE: If there is a charge, make sure you subtract it!
   c. From left to right, list each orbital that you pass before getting to your element

d. For each orbital you pass, write the amount of boxes in each orbital as a superscript of each house.

e. Check that the sum of the superscript numbers match the number of electrons from step 2.

Examples: Write the electron configurations of elements and ions.



Nitrogen:

Magnesium:

Ca^{2+}:

6. d-block electrons are
7. f-block electrons are
8. Electron Configuration Diagram

$1s^2$

$2s^2$ $2p^6$

$3s^2$ $3p^6$ $3d^{10}$

$4s^2$ $4p^6$ $4d^{10}$ $4f^{14}$

$5s^2$ $5p^6$ $5d^{10}$ $5f^{14}$

$6s^2$ $6p^6$ $6d^{10}$ $6f^{14}$

$7s^2$ $7p^6$ $7d^{10}$ $7f^{14}$

The order: $1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$ $4s^2$ $3d^{10}$ $4p^6$ $5s^2$ $4d^{10}$ $5p^6$ $6s^2$…

9. Shortcut Using Noble Gases
   a. Use the noble gas
   b. You can use the symbol for that noble gas as

Practice:

C.

1. Diagrams used to show the electrons and the energy levels they occupy in an atom.
2. to represent the different orbitals.
3. Electrons are represented by
4. Electron Principles (helps to answer how to draw them)
   a. First, present in each orbital.
   b.
      i.
      ii.
   c.
      i.
   d.
      i.

D. Excited vs. Ground State

1. All the electron configurations we have been writing have been for
2. If an orbital isn't filled when it should be, the atom is
3. If an orbital has more electrons than it can hold,