

Chemistry Module 7 Homework

Assignment #1

Read to page 223

- What did each of the following people contribute to our knowledge of atomic structure?
 - William Crookes
 - J. J. Thomson
 - Ernest Rutherford
 - James Chadwick
- If two electrical charged particles are attracted to each other, what can you conclude about their charges?
- Where will you find each of the following particles in an atom?
 - protons
 - electrons
 - neutrons
- What is an isotope? Give an example of two substances that are isotopes of the same element.
- Why is it so hard to separate one isotope from another?
- The three particles that make up an atom are the proton, neutron and electron. List them **in order** of increasing mass (smallest to largest). Which two particles have almost the same mass?
- Give the number of protons and neutrons in the following atoms:
 - ^{90}Mo
 - ^{53}Mn
 - Uranium – 238
 - Tungsten – 150
- What is the symbol of the atom made up of 80 protons and 122 neutrons?
- What is the symbol for the speed of light?
- What is speed of light in a vacuum in meters per second?
- If light has a frequency of 2.3×10^{14} Hz, what is its wavelength?
- What is the energy of a light wave with a frequency of 1.9×10^{20} Hz?
- If a light wave has a wavelength of 589 nm, what is its energy?
- If you have an orange light bulb and a blue light bulb:
 - Which one emits waves with the longest wavelength?
 - Which one emits light of higher frequency?
 - Which emits the higher energy light?
- Two identical green Christmas light bulbs are shining. Bulb A is much brighter than Bulb B.
 - Are their wavelengths the same or is one longer? If so, which one is longer?
 - Are their amplitudes the same or is one larger? If so, which one is larger?
 - Are their frequencies the same or is one higher? If so, which one is higher?

Chemistry Module 7 Homework

Assignment #2

Finish reading the module.

16. What did Niels Bohr contribute to atomic theory?
17. What is the difference between the planetary model of the atom and the quantum mechanical model of the atom?
18. One electron is in the 2p orbital and other is in the 3s orbital.
 - a. Which has more energy?
 - b. What is the shape of each electron's orbit?
19. Give the full electron configuration for each atom:
 - a. V
 - b. P
 - c. Ag
20. Give the abbreviated electron configuration for each atom:
 - a. La
 - b. I
 - c. Se
21. Honors – What does it mean when we say energy is quantized?
22. Honors - What is “ground state”?
23. Honors – For $n = 4$, what are the possible values of l ?
24. Honors – For $l = 2$, what are the possible values of m_l ?
25. Honors – Give the values for n , l , m_l , and m_s for each orbital in the 3p subshell.
26. Honors – List two differences between a diamagnetic substance and a paramagnetic substance.