

Name \_\_\_\_\_

Period \_\_\_\_\_

**Honors Chemistry Practice Test  
Atomic Structure**

**Form P**

$$C = 3.00 \times 10^8 \text{ m/s} \quad h = 6.626 \times 10^{-34} \text{ J s} \quad R = 3.29 \times 10^{15} \text{ Hz} \quad = 109,680 \text{ cm}^{-1}$$

**Part I: History of the Atom**

Explain the major contribution of each of the following people to our understanding of the atom. Discuss experimental details when possible. Define the terms related to atoms.

John Dalton	Neutron	Cathode Ray Tube
J.J. Thomson	Electron	Wavelength
Ernest Rutherford	Nucleus	Frequency
James Chadwick	Ion	Amplitude
Robert A. Millikan	Isotope	Crest
Niels Bohr	Mass Number	Trough
Max Planck	Atomic Number	Node
Albert Einstein	Alpha Particle	Bright Line Spectrum
Proton	Nucleon	h

**Part II: Mathematical Problems.** Perform the following calculations and remember significant digits.  $C = 3.00 \times 10^8 \text{ m/s}$   $h = 6.626 \times 10^{-34} \text{ J s}$   $R = 109,680 \text{ cm}^{-1}$

1. The frequency of some radiation is  $1.55 \times 10^{14} \text{ Hz}$ . What is its wavelength?
  
  
  
  
  
  
  
  
  
  
2. What is the frequency of some visible light whose wavelength is  $4.13 \times 10^{-7} \text{ meters}$ ?
  
  
  
  
  
  
  
  
  
  
3. What is the energy of one photon of the light in question #2?
  
  
  
  
  
  
  
  
  
  
4. The energy of a photon is  $7.66 \times 10^{-18} \text{ J}$ . What is the energy of a mole ( $6.022 \times 10^{23}$ ) of these photons?
  
  
  
  
  
  
  
  
  
  
5. You are given the mass spectrograph of the isotopes of neon. It states that you have 91% of neon 20, 0.2% of neon 21 and 8.8% of neon 22. Calculate the average atomic mass of neon.

**Part III:** Fill in the following table based on the periodic table.

Symbol	Atomic #	Mass	Protons	Neutrons	Electrons
C					
F <sup>-</sup>					
U					

**Part IV:** Electron Configurations. Draw the configurations of the following atoms.

1. Ne
2. P
3. K

Draw the configurations of the following ions. Please note the charges.

1. Li<sup>+</sup>
2. F<sup>-</sup>
3. O<sup>2-</sup>

**Part V:** The Bohr Model

1. Draw a picture of a continuous spectrum.
2. Draw a picture of a bright line spectrum.
3. Explain why the Bright line spectrum of Hydrogen is not a continuous spectrum.
4. An electron drops from the  $n=4$  to the  $n=2$  energy level. What is the wavelength of the radiation released? Is it visible light? If so what color is it?