## Atomic Structure, Isotopes, and Atomic Mass Review

- 1. Electrons occupy a(n) \_\_\_\_\_\_ around the nucleus.
- The two particles found in the nucleus which make up most of the mass of the atom are the \_\_\_\_\_\_ and the \_\_\_\_\_\_.

3. What causes an atom to be neutrally charged?

- 4. Electrons are \_\_\_\_\_ charged and have a mass of \_\_ AMU .
- 5. Protons are \_\_\_\_\_ charged and have a mass of \_\_ AMU.
- 6. Neutrons are \_\_\_\_\_ charged and have a mass of \_\_ AMU.
- 7. Isotopes are atoms that have the same \_\_\_\_\_\_.
- 8. A certain \_\_\_\_\_\_ of hydrogen contains two neutrons.
- 9. Isotopes of an atom could be detected based on what characteristic? \_\_\_\_\_\_

10. Experiments performed to reveal the structure of atoms led scientists to conclude that an atom's protons were \_\_\_\_\_\_ and electrons were \_\_\_\_\_\_

## 11. True or false:

The mass of an electron is equal to the mass of a proton. \_\_\_\_\_\_ The mass of an electron is less than the mass of a proton. \_\_\_\_\_\_ The mass of an electron is equal to the mass of a neutron. \_\_\_\_\_\_ The mass of an electron is greater than the mass of a neutron. \_\_\_\_\_\_

12. The modern model of the atom shows that electrons are

13. An electron has a charge of \_\_\_\_\_\_ and a smaller mass than a \_\_\_\_\_\_.

14. Compared to a proton, an electron has \_\_\_\_\_

15. How would you describe an atom? \_\_\_\_\_\_

- 16. When alpha particles are used to bombard gold foil, most of the alpha particles pass through undeflected. This result indicates that most of the volume of a gold atom consists of \_\_\_\_\_\_.
- 17. In the late 19<sup>th</sup> century, atoms were thought to be positively charged spheres with negatively charged electrons scattered throughout, like raisins in plum pudding. This is incorrect. Atoms were later shown to\_\_\_\_\_\_

Isotope	Percent Abundance	Atomic Mass
<sup>84</sup> X	0.56%	83.91 amu
<sup>86</sup> X	9.68%	85.914 amu
<sup>87</sup> X	7.00%	86.91 amu
8 <sup>8</sup> X	82.58%	87.91 amu

18. Based on the atomic masses, and percent abundances shown in the data table, calculate the average atomic mass of this element. AAM= (mass X relative abundance) + (mass X relative abundance) ...

AAM=\_\_\_\_\_

19. Hydrogen has three isotopes with mass numbers 1, 2, and 3 and has an average atomic mass of 1.00794 amu. This information indicates which isotope is more abundant?

Isotope	Mass	Relative Abundance
X-28	27.98	92.22
X-29	28.98	4.69
X-30	29.97	3.09

- The accepted values for the average atomic mass and percent natural abundance of each naturally occurring isotope of an unknown element are given in the data table above. Identify the unknown element.
  (Hint: use your AAM equation)
- 21. Which of the following isotopes is not the same element as the others?
  - A. <sup>19</sup><sub>19</sub>X
  - B. <sup>20</sup><sub>19</sub>X
  - C.  $^{21}_{19}X$
  - D.  $^{20}_{18}X$

22. Draw the Lewis Dot Structure to match the Bohr model to the right.



- 24. The following Lewis Dot Structure is of which of the following atoms?
  - A. Hydrogen
  - B. Magnesium
  - C. Carbon
  - D. Neon

25. The concentric rings in the Bohr Model correspond to \_\_\_\_\_\_.

26. The emission spectrum of a gas provides a method of identification through a specific sequence and thickness of

:X

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27. What is a characteristic of both the Bohr and Rutherford atomic models? \_\_\_\_\_\_

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