Electron Configuration, Atomic History, Periodic Trends and Ions Review

Name: [Name]
Date: ____________________________
Hour: ________________

1. How many orbitals are in the following sublevels?
   a. 1s sublevel __1__
   b. 4d sublevel __5__
   c. 4f sublevel __7__
   d. 3p sublevel __3__
   e. 3f sublevel __7__
   f. 5th energy level __25__

   S P d f g
   1 2 3 4 5 6 7 8

2. What are the types of sublevels in the following energy levels?
   a. n=1 __s__
   b. n=2 __s p__
   c. n=3 __s p d__
   d. n=4 __s p d f__

3. Write the electron configuration and orbital notation for the following elements.
   a. H __1s^1 prison
   b. Mg __1s^2 2s^2 2p^6 3s^2 3p^2__
   c. Br __1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^5 prison
   d. Ag __1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 5d^{10} 4f^{10} exception__

4. Arrange the following electromagnetic radiations in order of increasing frequency.
   a. Infrared 3
   b. Gamma rays 6
   c. Visible light 4
   d. Radio waves 1
   e. Microwaves 2
   f. Ultraviolet 5

5. Define Anion __a negative ion formed by gaining electrons__

6. Define Cation __a positive ion formed by losing electrons__
7. Which of the following are cations (c) and anions (a) or neither (n)?

a. Al \( \text{C} \)  
b. Na \( \text{A} \)  
c. N \( \text{A} \)  
d. Mg \( \text{C} \)  
e. B \( \text{C} \)  
g. He \( \text{N} \)  
h. Cu \( \text{C} \)  

8. Draw the electron dot diagrams for the following elements.

a. Al \( \text{Al} \)  
b. Na \( \text{Na} \)  
c. N \( \text{N} \)  
d. Mg \( \text{Mg} \)  
e. B \( \text{B} \)  
g. He \( \text{He} \)  

9. Using electron dot diagrams show the bonding of aluminum and sulfur.

\[ \text{Al}_2\text{S}_3 \]

10. Write the electron configuration for Al as an ion.

\[ \text{Al}^3+ \rightarrow 1s^2 2s^2 2p^6 (3s^2 3p^1) \]

11. What is the last filled orbital for the following?

a. Ra \( 7s^2 \)  

b. Ta \( 5d^3 \)  
c. Bi \( 6p^3 \)  

12. Contrast Dalton’s and Thompson’s atomic Model

Thompson has \( e^- \), Dalton doesn’t.

13. Contrast Thompson’s and Rutherford’s atomic model

Rutherford has nucleus, Thompson doesn’t.

14. Contrast Rutherford and Bohr’s atomic model

Bohr has \( e^- \) orbits, Rutherford doesn’t.

15. Contrast Bohr’s and Schrödinger’s atomic Model.

Schrödinger has clouds (orbits) for \( e^- \), Bohr has rings (orbits).

16. Explain why Rb has a higher 2nd I.E. than Sr.

Rb’s 2nd \( e^- \) comes from the 4 energy level whereas Sr comes from the 5th. The 2nd energy level is closer to the nucleus and more attractive.

17. Which is larger Sr or \( \text{Sr}^{2+} \)? Explain.

Sr is larger because it has 5 energy levels and \( \text{Sr}^{2+} \) only has 4. 5 energy levels is larger.