Name: _____ Date: _____ Period: _____

Study Guide: 8th grade - Chapter 8 Test, Elements and Chemical Bonds

1. Water is a covalent bond because_____.

2. Ionic bonds have the ability to _____.

3. When atoms gain or lose electrons, an ___ ___ ___ forms.

4. H_2 is an example of a _____ covalent bond.

5. Methane has four hydrogen atoms and one carbon atom. How would you write its chemical formula?_____

6. Salt is an example of an ____ _____ ____ ____ ____ bond.

7. Lithium is an atom represented as Li+. What does the "+" represent?
   a. Sodium has a tendency to lose a valence electron when it becomes an ion.
   b. One positive sign is listed because it only takes one electron to make the atom neutral.
   c. Sodium has a tendency to gain a valence electron when it becomes an ion.
   d. The plus sign means it can combine with almost every element found on the periodic table.

8. When atoms gain electrons, they become _____ charged ions.

9. Metallic bonds typically have _____ atoms.

10. This formula shows the chemical reaction that occurs when the body breaks down sugar.

$$C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O$$

How many hydrogen atoms are needed for this reaction to take place?

a. 1 c. 2
b. 12 d. 6

11. The majority of an atom's mass is located in its nucleus because it contains p __ __ t __ n __ (+) n __ u __ __ o __ s.

12. Polar bonds, like those found in the compound H_2O, form because the electrons in the bonds are unequally shared between oxygen and hydrogen.

13. _____ are numbers that indicate the number of each type of atom in a compound.

14. Explain why the noble gases found in group 18 do NOT form compounds readily.

15. Which type of molecular model is represented in this image?

$$O=C=O$$

a. ball-and-stick model c. dot diagram
b. space-filling model d. structural formula

16. _____ bonds occur when atoms share electrons.

17. Electrons are located on the _____ levels of atoms, outside of the nucleus.

18. Remember that the 1st energy level of an atom holds up to 2e-, the 2nd energy level holds up to 8e-, and the 3rd level holds up to 18e-.

19. Negative ions are formed by elements likely to gain electrons in a chemical bond because they only need a few to have a complete shell (ie. halogens of group 17).

20. Nonmetals have properties opposite to that of metals (ie. dull, not good conductors of heat or electricity, not malleable and ductile).

21. If (Lewis) dot diagrams represent the number of outer electrons in an atom, how many dots would be shown in the electron dot diagram for magnesium, element number 12? _____

22. What happens to theories in science? _____
_____
_____

23. Elements located along the zig-zag line are known as metalloids because they share properties of both
___ ____ ____ ___ ____ ____ and ___ ____ ____ ____ ____ ____ ____ ____ _____.

24. Metals have luster, hardness, high BPs and MPs, and are good conductors of heat and electricity.

25. Elements in the same group/family share similar <u>chemical</u> properties.

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KEY

1. Water is a covalent bond because it consists of two nonmetal atoms that share electrons to form a molecule (one end has a partial positive charge and the other end a partial negative charge).
2. Ionic bonds have the ability to form solid crystals.
3. When atoms gain or lose electrons, an ion forms.
4. H_2 is an example of a single covalent bond.
5. Methane has four hydrogen atoms and one carbon atom. How would you write its chemical formula? CH_4
6. Salt is an example of an ionic bond.
7. Sodium is an atom represented as Li+. What does the "+" represent?
   a. Sodium has a tendency to lose a valence electron when it becomes an ion.
   b. One positive sign is listed because it only takes one electron to make the atom neutral.
   c. Lithium has a tendency to gain a valence electron when it becomes an ion.
   d. The plus sign means it can combine with almost every element found on the periodic table.
8. When atoms gain electrons, they become negatively charged ions.
9. Metallic bonds typically have metal atoms.
10. This formula shows the chemical reaction that occurs when the body breaks down sugar.

$$C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O$$

How many hydrogen atoms are needed for this reaction to take place?

a. 1 c. 2

b. 12 d. 6

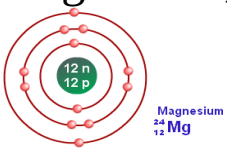
11. The majority of an atom's mass is located in its nucleus because it contains protons (+) neutrons.
12. Polar bonds, like those found in the compound H_2O, form because the electrons in the bonds are unequally shared between oxygen and

hydrogen.
13. Subscripts are numbers that indicate the number of each type of atom in a compound.
14. Explain why the noble gases found in group 18 do NOT form compounds readily.
Noble gases have eight electrons in their valence shells, therefore, they have no need to gain or lose electrons.
15. Which type of molecular model is represented in this image?

O=C=O

a. ball-and-stick model
b. space-filling model
c. dot diagram
d. structural formula

16. Covalent bonds occur when atoms share electrons.
17. Electrons are located on the energy levels of atoms, outside of the nucleus.
18. Remember that the 1st energy level of an atom holds up to 2e-, the 2nd energy level holds up to 8e-, and the 3rd level holds up to 18e-.
19. Negative ions are formed by elements likely to gain electrons in a chemical bond because they only need a few to have a complete shell (ie. halogens of group 17).
20. Nonmetals have properties opposite to that of metals (ie. dull, not good conductors of heat or electricity, not malleable and ductile).
21. If (Lewis) dot diagrams represent the number of outer electrons in an atom, how many dots would be shown in the electron dot diagram for magnesium, element number 12? 2



Bohr diagram

Mg:

Lewis dot structure

22. What happens to theories in science? They are revised once new information becomes available or is discovered.
23. Elements located along the zig-zag line are known as metalloids because they share properties of both metals and nonmetals.
24. Metals have luster, hardness, high BPs and MPs, and are good

conductors of heat and electricity.
25. Elements in the same group/family share similar chemical properties.