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. H2 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.



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

a. 1 b. 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 H2O, 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?



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? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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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 chemical properties.

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_

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

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. H2 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? CH4

6. Salt is an example of an ionic bond.

7. Lithium is an atom represented as Li+. What does the “+” represent?

a. Lithium 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.



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

a. 1 b. 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 H2O, 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?



a. ball-and-stick model c. dot diagram

b. space-filling model d. structural formula

16. Covalent bonds occur when atoms share electrons.

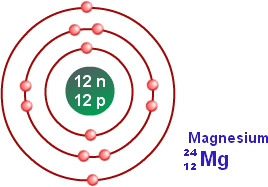
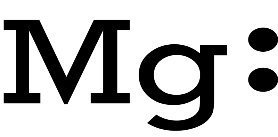
17. Electrons are located on the energy levels of atoms, outside of the nucleus.

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 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.