Chemical Compounds Test

Name: _____ **Date:** _____

1. What makes carbon an essential element for life?

   A. Its ability to form with metals and non-metals

   B. Its ability to form 4 covalent bonds

   C. Its ability to form 4 different ionic bonds

   D. all of the previous

2. Which of the following statements explains why the bond in hydrogen chloride (HCl) is polar covalent?

   A. The atomic mass of chlorine is greater than that of hydrogen.

   B. The chlorine atom is a lot larger than the hydrogen atom, so electrons tend to stay around the chlorine atom more than the hydrogen atom.

   C. The magnetic charge of a chlorine atom is greater than that of a hydrogen atom.

   D. The number of valence electrons in a chlorine atom is greater than that in a hydrogen atom.

3. Which type of bond is responsible for atoms of pure gold to remain bonded?

   A. covalent B. hydrogen

   C. ionic D. metallic

4. Which of the following is the correct name for MgI_2?

   A. Magneside Iodide B. Magnesium Iodide

   C. Magnesium Iodine D. Magneside Iodine

5. Which of the following statements best explains why ionic solids dissolve in water?

   A. Water has high surface tension.

   B. Water is a highly polar molecule.

   C. Water is more dense as a liquid than as a solid.

   D. Water has a higher boiling point than predicted by its molar mass.

6. When ions with opposite charges join, they form what kind of chemical bond?

   A. ionic B. hydrogen

   C. metallic D. covalent

7. How many total atoms are in the compound sodium carbonate (Na_2CO_3) ?

   A. 1 B. 3 C. 6 D. 7

8. How many covalent bonds can nitrogen form?

   A. 1 covalent bond B. 2 covalent bonds

   C. 3 covalent bonds D. 4 covalent bonds

9. Which of the following statements best explains why atoms bond?

   A. Atoms bond to make new substances.

   B. Atoms bond to become less chemically stable.

   C. Atoms bond to change from a liquid to a solid.

   D. Atoms bond to become more chemically stable.

10. What causes an object to have a positive charge?

A. Protons are removed.

B. Protons are added.

C. Electrons are removed.

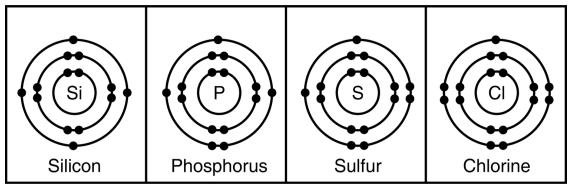
D. Electrons are added.

11. Which of the following are most directly involved in chemical bonding?

A. protons B. neutrons

C. alpha particles D. valence electrons

12. Use the diagram below to answer the following question.



Which element will gain only one electron during a chemical reaction?

A. silicon B. phosphorus

C. sulfur D. chlorine

13. Limestone is also known as Calcium Carbonate, What is the correct formula for calcium carbonate?

A. Ca_4C_2 B. $Ca_2(CO_2)_3$

C. $Ca_3(CO_2)_2$ D. $Ca_2(CO_3)_2$

14. Carbon reacts with chlorine to form . What is the name of this compound?

A. carbon 4-chloride

B. 1-carbon 4-chloride

C. tetracarbon chloride

D. carbon tetrachloride

15. When cations and anions join, they form what kind of chemical bond?

A. ionic B. hydrogen

C. metallic D. covalent

16. How are the bonds formed in a polar covalent compound?

A. Electrons are shared unequally.

B. Electrons are shared equally.

C. Electrons are gained.

D. Electrons are lost.

17. What is the correct formula for Barium Phosphate?

A. $Ba(PO_4)^{-3}$ B. $Ba_4(PO)_3$

C. Ba_3PO_4 D. $Ba_3(PO_4)_2$

18. Which of the following is the correct name for K_2S?

A. Potasside Sulfide B. Potassium Sulfur

C. Potassium Sulfide D. Potasside Sulfur

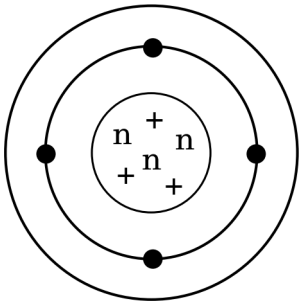
19. Which of the following is the most reactive non-metal?

A. Helium B. Fluorine

C. Bromine D. Oxygen

20. Which diagram represents an electrically neutral atom?

A.



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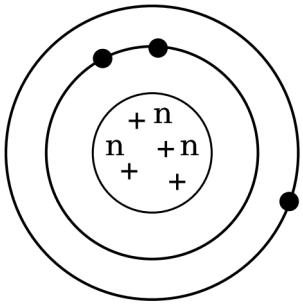

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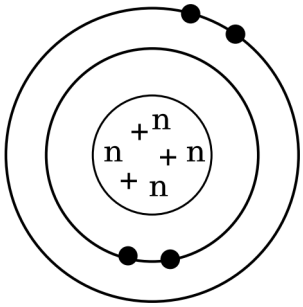
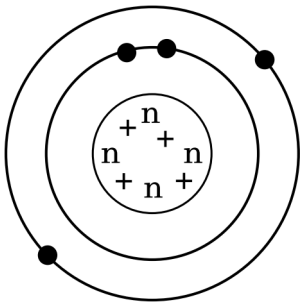


D.



21. How is soap and grease similar?

A. They both have polar ends that hate water

B. They both have nonpolar ends that like water

C. They both have a polar end that likes water and a nonpolar end that hates water

D. None of the above

22. What is the correct name for NH_4OH?

A. Ammonia

B. Ammonium Hydroxide

C. Sodium Acetate

D. Sodium Hydroxide

23. Barium and iodine combine to form an ionic compound. What is the chemical formula for this compound?

A. BaI B. BaI_2 C. Ba_2I D. Ba_2I_2

24. Which of the following occurs in an ionic bond?

A. Two ions share protons.

B. Two ions share electrons.

C. Similarly charged ions attract.

D. Oppositely charged ions attract.

25. Which is the correct formula for dinitrogen pentoxide?

A. N_4O B. NO_2 C. N_2O_5 D. NO_4

26. According to the periodic table, which statement correctly describes the change from a neutral atom of an element to its ion?

A. A fluorine atom forms a F^{-1} ion by losing one electron.

B. A sodium atom forms a Na^{+1} ion by losing two electrons.

C. A magnesium atom forms a Mg^{+2} ion by gaining two electrons.

D. A phosphorus atom forms a P^{-3} ion by gaining three electrons.

27. How can two different nonmetals form a compound?

A. by sharing protons

B. by sharing electrons

C. by transferring protons

D. by transferring electrons

28. Which of the following molecules has a nonpolar covalent bond?

A. H - Br B. H - Cl

C. H - F D. H - H

29. What oxidation number does an atom develop if it is an alkali metal?

A. +1 B. +2 C. +3 D. -1

30. What is the name of $KC_2H_3O_2$?

A. potassium acetate

B. potassium carbonate

C. potassium chlorate

D. potassium oxide

31. What is the name of the compound with the chemical formula $(NH_4)_2S$?

A. ammonium sulfide B. hydrogen sulfate

C. sulfur hydride D. sulfuric acid

32. Which is a unique characteristic of the bonding between metal atoms?

A. Atoms require additional electrons to reach a stable octet.

B. Atoms must give away electrons to reach a stable octet.

C. Atoms share valence electrons only with neighboring atoms to reach a stable octet.

D. Delocalized electrons move among many atoms creating a sea of electrons.

33. What is the correct formula for Boron Chloride?

A. BCl B. BCl_3

C. $B_3(ClO_3)_3$ D. $B(ClO_3)_3$

34. Which statement best describes the atoms of elements that form compounds by covalent bonding?

A. They share electrons between them.

B. They have a large difference in atomic mass.

C. They are in the same period in the periodic table.

D. They have a large difference in valence electron number.

35. Study the table below.

Atom	Number of Protons	Number of Neutrons	Number of Electrons
W	3	4	3
X	53	57	53
Y	55	60	54
Z	1	0	1

Which atom has a positive charge?

A. Atom W B. Atom X

C. Atom Y D. Atom Z

36. Which compound is most likely formed using covalent bonds?

A. CO_2 B. NaCl

C. Ca_2O_2 D. $MgCl_2$

37. How are the bonds formed in a nonpolar covalent compound?

A. Electrons are shared unequally.

B. Electrons are shared equally.

C. Electrons are gained.

D. Electrons are lost.

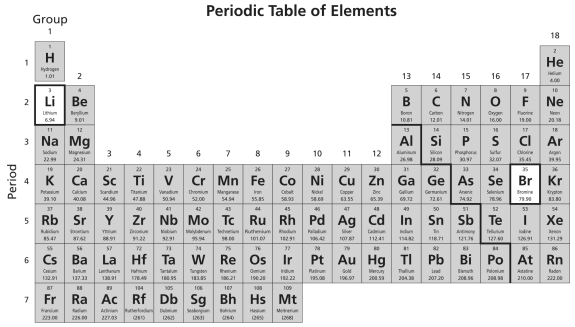
38. Your teacher gives you a list of compounds to classify based on their type of chemical bonding. Which substance should you classify as ionic?

A. H_2O B. CO_2 C. S_2O_2 D. NaCl

39. Which compound is most likely formed using covalent bonds?

A. CO_2 B. K_2O C. KBr D. $CaBr_2$

40. Sara wants to know if lithium (Li) and bromine (Br) will bond. She uses the following table to find the properties of the two elements.



Which statement describes the type of bond formed from these two elements?

A. Both Li and Br are metals that will form a metallic bond.

B. Li is a metal and Br is a nonmetal that will form an ionic bond.

C. Li is a nonmetal and Br is a metal that will form a covalent bond.

D. Both Li and Br are transition metals that will form a metalloid bond.

41. What oxidation number would an atom develop if it was a halogen?

A. +1 B. -1 C. +2 D. -2

42. In potassium fluoride, the potassium atom donates an electron and the fluorine atom takes an electron.

When the compound potassium fluoride is formed, which of the following are formed?

A. covalent bonds B. ionic bonds

C. magnetic forces D. nuclear forces

43. Which of the following describes a particle that contains 36 electrons, 49 neutrons, and 38 protons?

A. an ion with a charge of 2−

B. an ion with a charge of 2+

C. an atom with a mass of 38 amu

D. an atom with a mass of 49 amu

44. Ionic and covalent compounds are alike in that they both _____

A. form ions.

B. share electrons.

C. lose outer electrons.

D. fill outer electron levels.

45. What is the oxidation number of Aluminum?

A. 3 B. $^{+}3$ C. $^{-}3$ D. 0

46. How many total atoms are in a molecule of Boron Phosphate $B_3(PO_4)_3$?

A. 3 B. 7 C. 17 D. 18

47. A substance dissolves well in water but not in nonpolar benzene. Which of the following can be concluded about the substance?

A. The substance may be either polar or nonpolar.

B. The substance is nonpolar.

C. The substance is polar.

D. The substance is neither polar nor nonpolar.

48. Which compound is formed when aluminum bonds with oxygen?

A. AlO B. Al_3O_2 C. Al_2O_3 D. Al_3O_3

49. Which of the following is NOT a diatomic molecule?

A. H_2 B. Cl_2 C. CaI_2 D. Br2

50. Which of the following occurs in an ionic bond?

A. Two ions share protons.

B. Two ions share electrons.

C. Similarly charged ions attract.

D. Oppositely charged ions attract.