**Unit 9 Test Review: Chemical Bonding and VSEPR**

1. Which of these diatomics contain a double bond?
2. Iodine B) Fluorine C) Hydrogen D) Oxygen E) Nitrogen
3. Which of the following compounds is not covalent?
4. SCl2 B) KCl C) NO2 D) H2O E) Cl2
5. How many valence electrons does the HALOGEN group have?
6. A diatomic molecule with a triple covalent bond is:
7. F2 B) Br2 C) O2 D) N2 E) H2
8. If a bonding pair of electrons is unequally shared between two atoms, the bond is:
9. Which of the following has a tetrahedral geometry?
10. CO2
11. HF
12. H2O
13. CF4
14. NO2
15. Methane (CH4) contains \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonds and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_overall molecular polarity.

A) Polar, polar B) polar, nonpolar C) nonpolar, polar D) nonpolar, nonpolar

1. In forming the molecule HF, the F atom has how many lone pairs?
2. 2
3. 3
4. 4
5. 5
6. 6
7. An ionic compound is \_\_\_\_\_.
8. a salt
9. held together by an ionic bond
10. composed of cations and anions
11. usually a solid at room temperature
12. all of the above
13. Choose which answer correctly matches the molecule with its corresponding shape.
14. phosphorus trihydride --- trigonal pyramidal
15. dihydrogen monoxide --- trigonal planar
16. chlorine molecule --- bent
17. carbon tetrachloride --- trigonal pyramidal
18. boron trihydride --- tetrahedral
19. Which statement best characterizes water?
20. Water is a non-polar compound composed of non-polar bonds.
21. Water is a polar compound composed of polar bonds.
22. Water is a non-polar compound composed of polar bonds.
23. Water is a polar compound composed from non-polar bonds.
24. Water is a neutral compound composed from ionic bonds.
25. Which of the following statements is TRUE?
26. I2 exhibits a triple covalent bond
27. NaCl forms by sharing pairs of electrons
28. O2 exhibits a double covalent bond
29. NH3 is an ionic compound
30. PH3 is a non-polar molecule
31. Which of the following types of solids exhibits malleability?

A) covalent network B) ionic C) non-polar covalent D) metallic E) polar covalent

1. Ionic compounds will conduct electricity in the \_\_\_\_\_
2. Aqueous state
3. Solid state
4. Molten state
5. Both aqueous and solid states
6. Both aqueous and molten states

15. Why do atoms form chemical bonds?

16. What is a metallic bond? How do you recognize it? List ALL properties of metallic bonds.

17. What is an ionic bond? How can you recognize it? List ALL properties of ionic bonds.

18. What is a covalent bond? How can you recognize it? List ALL properties and the types of covalent bonds.

19. What is the difference between a polar and a nonpolar covalent BOND?

20. How do you determine whether a MOLECULE is polar or nonpolar?

21. Whenever you NASL, what is different when working with polyatomic ions?

22. A single bond contains \_\_\_\_\_\_\_ shared electrons. A double bond shares \_\_\_\_\_\_\_ electrons. A triple bond shares \_\_\_\_\_\_ electrons.

23. Which two elements are the exception to the octet rule when forming covalent bonds?

24. What does VSEPR stand for? What is the basis of VESPR theory?

25. Using a periodic table determine whether the following bonds would be metallic (M), ionic (I), polar covalent (PC), nonpolar covalent (NPC), or network covalent:

Li + O N + N S + Cl Zn + Zn

C + H S + O Ca + Br carbon chains

|  |  |  |
| --- | --- | --- |
|  | Ionic or  Covalent? | If **ionic** show the transfer of electrons and final ion combination.  If **covalent**, NASL, draw the Lewis structure, determine its shape, and give the molecular polarity (polar or nonpolar?).  SHOW ALL WORK! |
| 26.  **Mg + P** |  |  |
| 27.  **O2** |  | Shape:  Molecular Polarity: |
| 28.  **SO3-2** |  | Shape:  Molecular Polarity: |
| 29.  **CF4** |  | Shape:  Molecular Polarity: |
| 30.  **HBF2** |  | Shape:  Molecular Polarity: |