

Something bonderful

Name \_\_\_\_\_

A. metallic solid    B. ionic solid    C. molecular solid    D. covalent network solid

\_\_\_\_\_ 1. Gold

\_\_\_\_\_ 2. Barium bromide

\_\_\_\_\_ 3. Conduct electricity in the liquid, but NOT the solid state

\_\_\_\_\_ 4. Very good electrical conductors in the solid state

\_\_\_\_\_ 5. Diamonds and graphite

\_\_\_\_\_ 6. Generally have lower melting points than the other types of solid

\_\_\_\_\_ 7. Consist of an array of positively charged and negatively charged particles that are strongly attracted to each other

\_\_\_\_\_ 8. May be held together by hydrogen bonds.

A. H<sub>2</sub>S    B. CO<sub>2</sub>    C. KF    D. HBr

\_\_\_\_\_ 9. A linear molecule that is NOT a dipole

\_\_\_\_\_ 10. A linear molecule that IS a dipole

\_\_\_\_\_ 11. A non-linear molecule that is a dipole

\_\_\_\_\_ 12. Has the highest melting point of these substances

\_\_\_\_\_ 13. The best description of the bonds in an N<sub>2</sub> molecule is

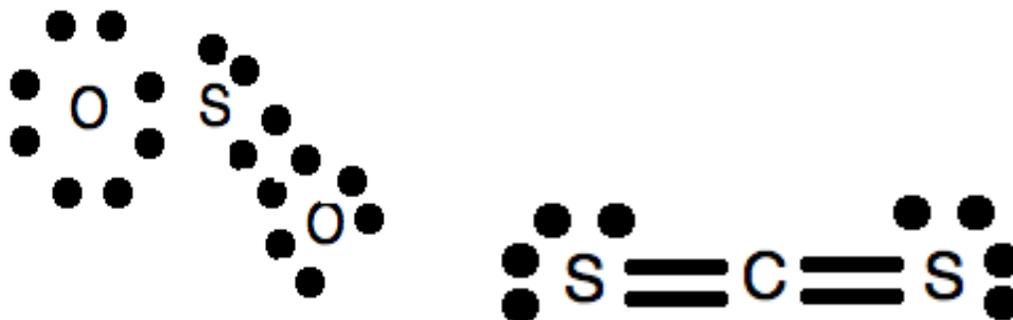
A) polar covalent, triple bonds    B) polar covalent, single bonds

C) nonpolar covalent, triple bonds    D) nonpolar covalent, single bonds

\_\_\_\_\_ 14. Which molecule has the strongest London dispersion forces?

A) O<sub>2</sub>    B) Cl<sub>2</sub>    C) F<sub>2</sub>    D) I<sub>2</sub>

\_\_\_\_\_ 15. The reaction  $\text{H}_2 \rightarrow 2 \text{H}$  involves bond breaking. The bond that breaks in this reaction is called A) a hydrogen bond    B) a polar covalent bond    C) a nonpolar covalent bond    D) a metallic bond



Base your answers to questions 16 - 18 on the two molecules illustrated above, which have been drawn to show their correct geometries.

- \_\_\_\_\_ 16. Based on these diagrams A) both molecules are dipoles  
 B) neither molecule is a dipole C)  $\text{SO}_2$  is a dipole, but  $\text{CS}_2$  is not a dipole  
 D)  $\text{CS}_2$  is a dipole, but  $\text{SO}_2$  is not a dipole
- \_\_\_\_\_ 17. The double line that connects the carbon with a sulfur atom represents  
 A) 4 electrons B) 2 electrons C) an ionic bond D) a London force
- \_\_\_\_\_ 18. The  $\text{SO}_2$  molecule contains A) two double bonds  
 B) one single bond and one double bond  
 C) one double bond and one quadruple bond  
 D) four single bonds
- \_\_\_\_\_ 19. Hydrogen bonding explains the relatively high boiling point of  
 A)  $\text{CH}_4$  B)  $\text{HI}$  C)  $\text{CO}_2$  D)  $\text{HF}$
- \_\_\_\_\_ 20. The phrase "sea of mobile electrons " is associated with  
 A) ionic bonds B) covalent bonds C) hydrogen bonds D) metallic bonds
- \_\_\_\_\_ 21. Which bond is the most highly polar? A)  $\text{C-H}$  B)  $\text{Cl-F}$   
 C)  $\text{H-F}$  D)  $\text{S-O}$

22. Draw the dot structures of the following molecules:

- A.  $\text{CO}_2$             B.  $\text{CBr}_4$             C.  $\text{PH}_3$

23. Draw a diagram that shows the hydrogen bonding in liquid water. Be sure to label the hydrogen bond(s).

24. Nitrogen forms a compound with iodine called nitrogen triiodide,  $\text{NI}_3$

The compound has the same geometry as ammonia.

A. Draw the dot structure of  $\text{NI}_3$

B. Is this molecule a dipole? Explain your answer.

C. One of the atoms in  $\text{NI}_3$  acquires a slight negative charge. Which atom is slightly negative? Explain how you know.

Extra Credit: Draw the dot structure of a sulfite ion. (See table E)

II. What is the total number of "dots" that should be shown in the dot structure of a carbonate ion? (See table E)