Chem I Name _____

Date _____ Per _____

Warm-Up For the Chemical Bonding Test

A. Match the terms on the right with the phrases on the left (terms may be used more than once):

1. _____ Bond that involves the equal sharing of electrons.
2. _____ Calcium has _____ valence electrons.
3._____ Kind of bond if the electronegativity difference is 1.9.
4. _____ Atom that wants 8 valence electrons when bonding.
5. _____ Nitrogen has ___ valence electrons.
6. _____ Bond that involves an uneven sharing of electrons.
7. _____ Shape of carbon dioxide.
8._____ Shape of water.
9. _____ Iodine has ____ valence electrons.
10._____ Shape of ammonia (NH_3).
11. _____ Bond between metals.
12._____ Kind of electrons involved in bonds.
13. _____ The ability of an atom to attract atoms in a bond.
14._____ Atom that wants 4 valence electrons when bonding.
15. _____ Bond between a metal and a non-metal.
16._____ Kind of bond if the electronegativity difference is 1.6.
17. _____ Bond that involves the transfer of electrons.
18. _____ or _____Bond between two non-metals.
19. _____ Shape of carbon tetrachloride.
20._____ Atom that wants 2 valence electrons when bonding.
21._____ Atom that wants 6 valence electrons when bonding.
22._____ Kind of bond if the electronegativity difference is 0.2.
23._____ Kind of bond if the electronegativity difference is 1.1.
24. _____ Gallium has _____ valence electrons.

a. core
b. valence
c. linear
d. trigonal planar
e. trigonal pyramidal
f. tetrahedral
g. bent
h. ionic
m. non-polar covalent
n. polar covalent
o. metallic
p. electronegativity
q. chlorine
r. hydrogen
s. beryllium
t. boron
u. one
v. two
w. three
x. four
y. five
z. six
aa. seven
bb. eight

B. Lewis Structures and Molecular Geometry.

25. The Five Shapes: VSEPR For each of the following five molecules show both the Lewis Dot structure and a 3D sketch, using the ball and stick model (like the Molecular Model Lab) to show the geometry.

a. Methane Gas: CH_4 Name of shape: _____

Lewis Structure 3D sketch

b. Ammonia Gas: NH_3 Name of shape: _____

Lewis Structure 3D sketch

c. Water : H_2O Name of shape: _____

Lewis Structure 3D sketch

d. Boron Trihydride : BH_3 Name of shape: _____

Lewis Structure 3D sketch

e. Carbon Dioxide: CO_2 Name of shape: _____

Lewis Structure 3D sketch

26. Determine the number of valence electrons and then draw the Lewis structure for each of the following molecules (assume they're all covalently bonded). Draw resonance structures if possible. Then name the shape of each.

a. SCl_2 val e - = _____ shape = _____ b. COH_2 val e - = _____ shape = _____

c. $BeCl_2$ val e - = ____ shape = _____ d. NO_2^- val e - = _____ shape = _____

e. C_2H_2 val e - = _____ shape = _____ f. CI_4 val e - = _____ shape = _____

27. Draw the Lewis Dot Structure of:

a. the main gas in the air we breathe.

b. the second most plentiful gas in the air we breathe.

c. carbon dioxide.

C. Ionic Compounds

28. What ion would each of these be? (show the symbol and the charge)

a. magnesium _____ d. iron (III) _____

b. nitrogen _____ e. potassium _____

c. sulfur _____ f. lead (IV) _____

29. Name each of these ionic compounds. Roman numerals may or may not be necessary.

(Which cations require the use of Roman numerals?_____)

a. $AlBr_3$ _____

b. CoS_4 _____

c. Pb_3P_4 _____

d. Ga_2O_3 _____

e. FeN _____

30. Write the formulas for the ionic compounds that would result from each of these combinations.

a. magnesium and oxygen _____

b. palladium (V) and nitrogen _____

c. cadmium (III) and bromine _____

d. tin (II) and iodine _____

D. Finally, Grams, Moles, and Molecules:

31. What would be the mass of 14.32 moles of iron(III) oxide?

32. What would 2.11×10^{26} molecules of strontium nitride weigh in grams?

33. How many molecules would there be in 127.4 grams of gold (III) chloride?

Study well, everybody - Good luck!