Big Chem Problem Set

BONDING

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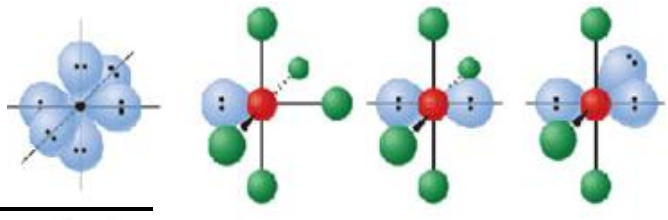

Memorize the name, symbol, and charge of each polyatomic ion from the reference table- you will be blitzed on these in 2nd week of this unit: hydronium, ammonium, acetate, carbonate, chlorate, nitrate, hydroxide, phosphate, sulfate, peroxide.

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1. Do metals tend to lose or gain electronc when bonding. Explain in terms of ionization energy and electronegativity.
2. Do nonmetals tend to lost or gain electrons when bonding? Explain in terms of ionization energy and electronegativity.
3. What types of elements (metals or nonmetals) participate in ionic bonds? Describe what happens to electrons in an ionic bond in terms of the atoms that participate.
4. What types of elements (metals or nonmetals) participate in covalent bonds? Describe what happens to electrons in a covalent bond in terms of the atoms that participate.
5. What is bond polarity? In terms of electronegativity difference, explain the difference between a polar and a nonpolar covalent bond.
6. Describe, in terms of distribution of electrons, the difference between a polar covalent bond and a nonpolar covalent bond. Include in your descriptions one example of a molecule that exhibits each bond type.
7. Determine number of atoms of each type of element and the total number of atoms in the compound: $4NaHCO_3$, $15HCl$, $3Al_2O_3$, $7Sn(NO_2)_4$, $4Mn_2(Cr_2O_7)_7$, $9Na_2SO_3$
8. Draw Lewis structures for each: C_2Cl_2, H_2S, CS_2, SiO_2, CO_2, NH_3, AsF_3
9. When writing formulas, which element is written first? Does it have a positive or negative oxidation state?
10. When writing formulas, what element is written last? What type of oxidation state does it have?
11. Determine the oxidation state of every element in each: $BaCl_2$, PbO_2, $MnCl_7$, Cu_2S, FeO, $NaHCO_3$
12. Determine the formula for compounds of the elements and polyatomic ions below: NH_4 and Cl, Ba and Br, Al and C, Na and O, Al and SO_4, Mg and NO_3, Li and S, Na and SO_4, K and PO_4, Ca and F
13. Name these: NaCl, CuSo4, (NH4)2S, BaO, LiF, $Sn(NO_3)_4$, K_3N, $HgBr_2$, CaI_2, $Mg_3(PO_4)_2$
14. Write the formula of these: iron III oxide, chromium III carbonate, calcium sulfide, lead II arsenide, ammonium nitrate, potassium oxalate, aluminum acetate, cesium thiosulfate, strontium phosphide, tin IV oxide
15. Name these: CuBr, NH_4CH_3COO, K_2SO_4, $Fe_2(SO_4)_3$, CuO, H_2S, FeF_3, KI, $LiNO_3$, BaO, $Al_2(CO_3)_3$, FeO, MgS, $Ba_3(PO_4)_2$, $Fe(NO_2)_3$, $Na_2S_2O_3$, P_2O_5, $CaCl_2$, $(NH_4)_2S$, CuF, $BrCl_5$, SO_3, P_2O_3, As_3P_5, IF_7, SeS_3, SO_2, CO, SBr_6, N_2O_5
16. What is a dipole? Give an example of a dipole molecule, draw a picture of it and label its + and negative poles.
17. What is a hydrogen bond? What is a Van der Waals force? Give an example of each.
18. State what holds each together: ionic bonds, covalent bonds, metallic bonds, dipole-dipole attractions, hydrogen bonds, or other IM forces: Water, Table salt, Iron railing, Diamond, Gasoline, Gold, Iron oxide, Calcium phosphate (tooth enamel)