Chem I

Name Key

Date _____ Per _____

Worksheet # C22: Formula Mass and Ionic Compounds

1. Warm Up: What ion do each of the following atoms become? (give the symbol and charge)

a. calcium Ca^{+2}

b. oxygen O^{-2}

c. iron II Fe^{+2}

d. gallium Ga^{+3}

e. bromine Br^{-1}

f. lead IV Pb^{+4}

g. lithium Li^{+1}

h. phosphorus P^{-3}

i. nitrogen N^{-3}

j. magnesium Mg^{+2}

2. What would be the formulas of the following compounds?

a. magnesium chloride $MgCl_2$

b. tin II fluoride SnF_2

c. gallium oxide Ga_2O_3

d. sodium phosphide Na_3P

e. aluminum sulfide Al_2S_3

3. How many atoms or molecules are in a mole? 6.02×10^{23} molecules (or atoms)

4. How much would one mole of each of the following weigh?

a. calcium 40.08 g

b. gallium 69.72 g

c. bromine 79.90 g

d. lead 207.20 g

e. nitrogen 14.01 g

f. magnesium 24.31 g

5. How much would 1.00 mole of calcium chloride weigh? (show your set up)

Ca: 40.08
Cl = 35.45
Cl = 35.45
110.98 g/mole (3 sig figs)

with 3 sig figs: 111 g

Fe+3 I-1

6. How much would 3.05 moles of iron III iodide weigh? (show your set up) FeI_3

Fe: 55.85
3 I: 380.70
436.55 g/mol

$3.05 \text{ mol} \times \frac{436.55 \text{ g}}{1 \text{ mole}} = 1331.4775$

= 1330 g (3 sig figs)

7. How many molecules would there be in .0444 mole of potassium oxide? $K^{+} \; O^{-2}$ K_2O

$.0444 \text{ mole} \times \frac{6.02 \times 10^{23} \text{ molec}}{1 \text{ mol}} = 2.67288 \text{ E}22$

$= 2.67 \times 10^{22} \text{ molecules}$

(three sig figs)

8. How much would 5.99 x 10^{20} molecules of tin IV sulfide weigh? $Sn^{+4} \; S^{-2}$ SnS_2

Sn = 118.71

2S = 64.14

182.85 g/mol

$5.99 \times 10^{20} \text{ molec} \times \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ molec}} \times \frac{182.85 \text{ g}}{1 \text{ mole}} = .181938 \ldots$

$= .182 \text{ g}$

(3 sig figs again)

9. How many molecules would there be in 14.2 grams of magnesium oxide? $Mg^{+2} \; O^{-2}$ MgO

Mg = 24.31

O = 16.00

40.31 g/mol

$14.2 \text{ g} \times \frac{1 \text{ mole}}{40.31 \text{ g}} \times \frac{6.02 \times 10^{23} \text{ molec}}{1 \text{ mole}} = 2.1206648 \text{ E}23$

$= 2.12 \times 10^{23} \text{ molec}$

(3 sig figs. Hmm)

10. How much would 3.55 x 10^{20} molecules of lead II iodide weigh? $Pb^{+2} \; I^{-1}$ PbI_2

Pb = 207.20

2I = 253.80

461.00 g/mol

$3.55 \times 10^{20} \text{ molec} \times \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ molec}} \times \frac{461.00 \text{ g}}{1 \text{ mol}} = .271852159 \ldots$

$= .272 \text{ g}$

yep. same sig figs.

11. What's a mole of ugly weigh? (think Spanish)

FeO : Fe = 55.85

O = 16.00

71.85 g/mole