

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⁺²f. lead IV Pb⁺⁴b. oxygen O⁻²g. lithium Li⁺¹c. iron II Fe⁺²h. phosphorus P⁻³d. gallium Ga⁺³i. nitrogen N⁻³e. bromine Br⁻¹j. magnesium Mg⁺²

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

a. magnesium chloride MgCl₂b. tin II fluoride SnF₂c. gallium oxide Ga₂O₃d. sodium phosphide Na₃Pe. aluminum sulfide Al₂S₃3. 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 gd. lead 207.20 gb. gallium 69.72 ge. nitrogen 14.01 gc. bromine 79.90 gf. magnesium 24.31 g

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

$$\begin{array}{r} \text{Ca} = 40.08 \\ \text{Cl} = 35.45 \\ \text{Cl} = 35.45 \\ \hline 110.98 \text{ g/mole} \end{array}$$

with 3 sig figs = 111 g
(3 sig figs)

6. How much would 3.05 moles of iron III iodide weigh? (show your set up) FeI₃

$$\begin{array}{r} \text{Fe} = 55.85 \\ 3 \text{ I} = 380.70 \\ \hline 436.55 \text{ g/mol} \end{array}$$

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

= 1330 g
(3 sig figs)

7. How many molecules would there be in .0444 mole of potassium oxide? K_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 5.99×10^{20} molecules of tin IV sulfide weigh? SnS_2

$Sn = 118.71$
 $2S = 64.14$
182.85 g/mol

$$5.99 \times 10^{20} \text{ molec} \times \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ molec}} \times \frac{182.85 \text{ g}}{1 \text{ mole}} = .1819382824$$

$$= .182 \text{ g}$$

(3 sig figs again)

9. How many molecules would there be in 14.2 grams of magnesium oxide? 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. Hum)

10. How much would 3.55×10^{20} molecules of lead II iodide weigh? PbI_2

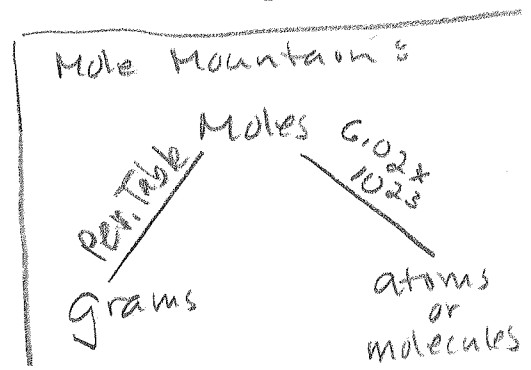
$Pb = 207.20$
 $2I = 253.80$
461.00 g/mol

$$3.55 \times 10^{20} \text{ molec} \times \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ molec}} \times \frac{461.00 \text{ g}}{1 \text{ mol}} = .2718521595$$

$$= .272 \text{ g}$$

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

FeO
 $Fe = 55.85$
 $O = 16.00$
71.85 g/mole



yep, same sig figs.