Name_____

Date_____ Pd_____

Mole Ratios and Mole-to-Mole Conversions

Balance the following equations and give the mole ratios for the compounds in question

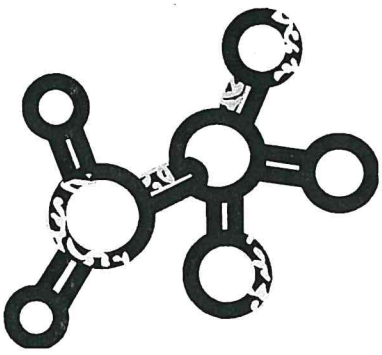
1. 1 $BaCl_2$ + 2 $KClO_3$ → 1 $Ba(ClO_3)_2$ + 2 KCl

Moles $BaCl_2$: Moles KCl

1 : 2

Moles $KClO_3$: Moles KCl

2 : 2 = 1 : 1



2. 2 H_2 + 1 O_2 → 2 H_2O

Moles H_2 : Moles H_2O

2 : 2 = 1 : 1

Moles O_2 : Moles H_2

1 : 2

3. 1 $(NH_4)_2CO_3$ + 1 $CuCl_2$ → 2 NH_4Cl + 1 $CuCO_3$

Moles ammonium carbonate : Moles ammonium chloride

1 : 2

4. 1 $CaCO_3$ → 1 CaO + 1 CO_2

Moles of calcium carbonate : Moles of calcium oxide

1 : 1

Name_____

Date_____ Pd_____

Balance the following and solve the problem. Show all work in dimensional analysis form.

5. 1 C_3H_8 + 5 O_2 → 4 H_2O + 3 CO_2

How many moles of water will be produced if 1.2 mol of oxygen reacts with excess C_3H_8?

$H_2O : O_2$ → 4 : 5

$\frac{H_2O}{O_2}$ $\frac{4}{5} = \frac{x}{1.2}$ → $\frac{4(1.2)}{5} = \frac{5x}{5}$

$x = 0.96$ mols of H_2O

6. 2 K + 1 $HgCl_2$ → 1 Hg + 2 KCl

How many moles of potassium are needed to react with .633 moles of $HgCl_2$?

$K : HgCl_2$ → 2 : 1

$\frac{K}{HgCl_2}$ $\frac{2}{1} = \frac{x}{0.633}$ → $2(0.633) = 1x$

$x = 1.266$ mols K needed

7. 3 Hf + 2 N_2 → 1 Hf_3N_4

How many moles of hafnium nitride are produced when 2.00 moles of nitrogen reacts with excess hafnium?

$Hf_3N_4 : N_2$ → 1 : 2

$\frac{Hf_3N_4}{N_2}$ $\frac{1}{2} = \frac{x}{2.00}$ → $x = 1.00$ mols Hf_3N_4 produced.

8. 1 $Pb(NO_3)_4$ + 4 NaI → 1 PbI_4 + 4 $NaNO_3$

How many moles of PbI_4 are produced when 11.7 moles of sodium nitrate are produced?

$PbI_4 : NaNO_3$ → 1 : 4

$\frac{PbI_4}{NaNO_3}$ $\frac{1}{4} = \frac{x}{11.7}$ → $\frac{11.7}{4} = \frac{4x}{4}$

$x = 2.925$ moles $NaNO_3$ produced.

9. 1 Cl_2 + 2 KI → 2 KCl + 1 I_2

How many moles of chlorine are need to produce .4789 moles of iodine?

$Cl_2 : I_2$ → 1 : 1 ∴ 0.4789 moles of Cl_2 needed.

10. 1 $Ba(CN)_2$ + 1 H_2SO_4 → 1 $BaSO_4$ + 2 HCN

How many moles of barium cyanide are need to produce 12.0 moles of barium sulfate?

$Ba(CN)_2 : BaSO_4$ → 1 : 1 ∴ If 12 moles of barium sulphate are produced 12 moles of Barium cyanide are needed.