Learning Target 8.0

Name: KE

Per: _____

1) Mole-Mole Problems

Beginning Stoichiometry

HCl +2 -1

1. Lead will react with hydrochloric acid to produce lead (II) chloride and hydrogen. How many moles of hydrochloric acid are needed to completely react with 0.36 mole of lead? $Pb + 2HCl \rightarrow PbCl_2 + H_2$

$$0.36 \text{ mol } Pb \left| \frac{2 \text{ mol } HCl}{1 \text{ mol } Pb} \right. = 0.72 \text{ mol } HCl$$

2. How many moles of HNO_3 will be produced when 0.51 mole of N_2O_5 reacts according to the following equation?

$N_2O_5 + H_2O \rightarrow 2HNO_3$

$$0.51 \text{ mol } N_2O_5 \left| \frac{2 \text{ mol } HNO_3}{1 \text{ mol } N_2O_5} \right. = 1.02 \text{ mol } HNO_3$$

3. Carbon will react with Zinc Oxide to produce Zinc and Carbon dioxide. How many moles of Carbon-dioxide will be produced if 0.38 mole of ZnO is completely reacted?

$C + 2ZnO \rightarrow 2Zn + CO_2$

$$0.38 \text{ mol } ZnO \left| \frac{1 \text{ mol } CO_2}{2 \text{ mol } ZnO} \right. = 0.19 \text{ mol } CO_2$$

4. How many moles of NaBr will be produced when 0.69 mol of bromine reacts according to the following equation?

$Br_2 + 2NaI \rightarrow 2NaBr + I_2$

$$0.69 \text{ mol } Br_2 \left| \frac{2 \text{ mol } NaBr}{1 \text{ mol } Br_2} \right. = .98 \text{ mol } NaBr$$

5. Phosphorus will react with bromine to produce phosphorus tribromide. How many moles of phosphorus tribromide will be produced if 0.78 mol of bromine is reacted?

$2P + 3Br_2 \rightarrow 2PBr_3$

$$0.78 \text{ mol } Br_2 \left| \frac{2 \text{ mol } PBr_3}{3 \text{ mol } Br_2} \right. = 0.52 \text{ mol } PBr_3$$

6. How many moles of hydrogen will be produced if 0.44 mol of CaH2 reacts according to the following equation?

$CaH_2 + H_2O \rightarrow Ca(OH)_2 + H_2$

$$0.44 \text{ mol } CaH_2 \left| \frac{1 \text{ mol } H_2}{1 \text{ mol } CaH_2} \right. = 0.44 \text{ mol } H_2$$

7. How many moles of Oxygen will be needed to react with 0.38 mol of C_3H_8 according to the following equation?

$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

$$0.38 \text{ mol } C_3H_8 \left| \frac{5 \text{ mol } O_2}{1 \text{ mol } C_3H_7 \quad NH_3} \right. = 1.9 \text{ mol } O_2$$

8. Nitrogen can react with hydrogen to produce ammonia. How many moles of nitrogen will be needed to produce 0.48 mol of NH_3? $N_2 + 3H_2 \rightarrow 2NH_3$

$$0.48 \text{ mol } NH_3 \left| \frac{1 \text{ mol } N_2}{2 \text{ mol } NH_3} \right. = 0.24 \text{ mol } N_2$$

9. Iron will react with oxygen to produce Fe_2O_3. How many moles of Fe_2O_3 will be produced if 0.18 mol of Fe reacts? $4Fe + 3O_2 \rightarrow 2Fe_2O_3$

$$0.18 \text{ mol } Fe \left| \frac{1 \text{ mol } Fe_2O_3}{2 \text{ mol } Fe} \right. = 0.09 \text{ mol } Fe_2O_3$$

10. How many moles of water will be produced if 2.35 mol of oxygen reacts according to the following equation?

$2C_6H_6 + 15O_2 \rightarrow 12CO_2 + 6H_2O$

$$2.35 \text{ mol } O_2 \left| \frac{6 \text{ mol } H_2O}{15 \text{ mol } O_2} \right. = 0.94 \text{ mol } H_2O$$