

### Worksheet 3.3 – Limiting and Excess Reactants

- Lead (II) nitrate reacts with sodium iodide react to produce a solid product lead (II) iodide and sodium nitrate.
  - If 0.0830g of lead (II) nitrate solution is mixed with 0.300g sodium iodide solution, calculate the mass of the solid product made.
  - If 0.662g of lead (II) nitrate solution is mixed with 0.300g of sodium iodide solution, calculate the mass of the solid product made.
- If 15.0g of aluminum and 72.0g of hydrochloric acid are allowed to react, determine the mass of hydrogen gas produced.
- A mixture of 16.3g of zinc and 21.6g of bromine were heated until the reaction was completed. Calculate the mass of the product.
- If 10.0g of powdered iron is heated with 10.0 of sulfur in an open crucible, what is the mass of iron (II) sulfide that is formed? The reaction is as follows:  $8 \text{ Fe} + \text{S}_8 \longrightarrow 8 \text{ FeS}$
- If 15.5g of aluminum is allowed to react with 46.7g of chlorine gas, calculate the mass of the product.
- Assume 2.40 mole of oxygen gas are reacted with 2.46 mole of magnesium, determine the mole of product formed.
- If 13.1g of potassium is reacted with 18.0g of oxygen gas, determine the mass of products made.
- What mass of carbon dioxide is produced when 16.0g of EACH reactant, methane ( $\text{CH}_4$ ) and oxygen gas undergoes an oxidation reaction?

#### Answers:

- a)  $\text{Pb}(\text{NO}_3)_2$  limiting – 0.116g  $\text{PbI}_2$
  - b)  $\text{NaI}$  limiting – 0.461g  $\text{PbI}_2$
- $\text{Al}$  limiting – 1.7g  $\text{H}_2$
- $\text{Br}_2$  limiting – 30.4g  $\text{ZnBr}_2$
- $\text{Fe}$  limiting - 15.7g  $\text{FeS}$
- $\text{Cl}_2$  limiting – 58.6g  $\text{AlCl}_3$
- $\text{Mg}$  limiting – 2.46 mol  $\text{MgO}$
- $\text{K}$  limiting - 15.8g  $\text{K}_2\text{O}$
- $\text{O}_2$  limiting – 11.0g  $\text{CO}_2$