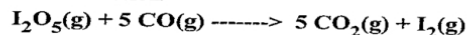


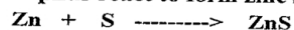
**Limiting Reagents and Percentage Yield Worksheet**

## 1. Consider the reaction



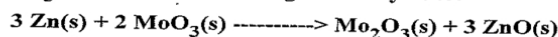
- a) 80.0 grams of iodine(V) oxide,  $\text{I}_2\text{O}_5$ , reacts with 28.0 grams of carbon monoxide,  $\text{CO}$ . Determine the mass of iodine  $\text{I}_2$ , which could be produced?
- b) If, in the above situation, only 0.160 moles, of iodine,  $\text{I}_2$  was produced.
- what mass of iodine was produced?
  - what percentage yield of iodine was produced.

## 2. Zinc and sulphur react to form zinc sulphide according to the equation.



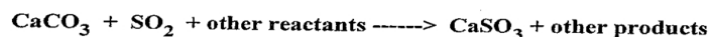
If 25.0 g of zinc and 30.0 g of sulphur are mixed,

- Which chemical is the limiting reactant?
  - How many grams of  $\text{ZnS}$  will be formed?
  - How many grams of the excess reactant will remain after the reaction is over?
3. Which element is in excess when 3.00 grams of  $\text{Mg}$  is ignited in 2.20 grams of pure oxygen? What mass is in excess? What mass of  $\text{MgO}$  is formed?
4. How many grams of  $\text{Al}_2\text{S}_3$  are formed when 5.00 grams of  $\text{Al}$  is heated with 10.0 grams  $\text{S}$ ?
5. When  $\text{MoO}_3$  and  $\text{Zn}$  are heated together they react



What mass of  $\text{ZnO}$  is formed when 20.0 grams of  $\text{MoO}_3$  is reacted with 10.0 grams of  $\text{Zn}$ ?

6. Silver nitrate,  $\text{AgNO}_3$ , reacts with ferric chloride,  $\text{FeCl}_3$ , to give silver chloride,  $\text{AgCl}$ , and ferric nitrate,  $\text{Fe}(\text{NO}_3)_3$ . In a particular experiment, it was planned to mix a solution containing 25.0 g of  $\text{AgNO}_3$  with another solution containing 45.0 grams of  $\text{FeCl}_3$ .
- Write the chemical equation for the reaction.
  - Which reactant is the limiting reactant?
  - What is the maximum number of moles of  $\text{AgCl}$  that could be obtained from this mixture?
  - What is the maximum number of grams of  $\text{AgCl}$  that could be obtained?
  - How many grams of the reactant in excess will remain after the reaction is over?
7. Solid calcium carbonate,  $\text{CaCO}_3$ , is able to remove sulphur dioxide from waste gases by the reaction:



In a particular experiment, 255 g of  $\text{CaCO}_3$  was exposed to 135 g of  $\text{SO}_2$  in the presence of an excess amount of the other chemicals required for the reaction.

- What is the theoretical yield of  $\text{CaSO}_3$ ?
  - If only 198 g of  $\text{CaSO}_3$  was isolated from the products, what was the percentage yield of  $\text{CaSO}_3$  in this experiment?
8. A research supervisor told a chemist to make 100 g of chlorobenzene from the reaction of benzene with chlorine and to expect a yield no higher than 65%. What is the minimum quantity of benzene that can give 100 g of chlorobenzene if the yield is 65%? The equation for the reaction is:

