

Name: _____

Period: _____

Seat#: _____

- Show work and include ALL units.
- Do these on binder paper.
- Label clearly so I know what I am looking at. Box and label final answers!
- Some answers are provided at the end of the problem. They are underlined.

- 1) Consider the unbalanced reaction $\text{I}_2\text{O}_5(\text{g}) + \text{CO}(\text{g}) \rightarrow \text{CO}_2(\text{g}) + \text{I}_2(\text{g})$
80.0 grams of iodine(V) oxide, I_2O_5 , reacts with 28.0 grams of carbon monoxide, CO.
- Determine the mass of iodine I_2 , which could be produced? 50.7 g
 - If only 0.160 moles of iodine, I_2 was produced, what mass of iodine was produced? 40.6 g
 - What percentage yield of iodine was produced? 80.1%
- 2) Zinc and sulfur react to form zinc sulfide according to the equation. $\text{Zn} + \text{S} \rightarrow \text{ZnS}$
If 25.0 g of zinc and 30.0 g of sulfur are mixed,
- Which chemical is the limiting reactant? Zn
 - How many grams of ZnS will be formed? 37.26 g
 - How many grams of the excess reactant will remain after the reaction is over? 17.7 g
- 3) Mg is ignited in pure oxygen.
- Which element is in excess when 3.00 grams of Mg is ignited in 2.20 grams of pure oxygen?
 - What mass is in excess? 0.23 g
 - What mass of MgO is formed? 4.97 g
- 4) How many grams of Al_2S_3 are formed when 5.00 grams of Al is heated with 10.0 grams S? 13.91 g
- 5) When MoO_3 and Zn are heated together they react $\text{Zn}(\text{s}) + \text{MoO}_3(\text{s}) \rightarrow \text{Mo}_2\text{O}_3(\text{s}) + \text{ZnO}(\text{s})$
What mass of ZnO is formed when 20.0 grams of MoO_3 is reacted with 10.0 grams of Zn? 12.45 g
- 6) Silver nitrate, AgNO_3 , reacts with ferric chloride, FeCl_3 , to give silver chloride, 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 AgNO_3 with another solution containing 45.0 grams of FeCl_3 .
- Write the chemical equation for the reaction.
 - Which reactant is the limiting reactant? AgNO_3
 - What is the maximum number of moles of AgCl that could be obtained from this mixture? 0.147 mol
 - What is the maximum number of grams of AgCl that could be obtained? 21.9 g
 - How many grams of the reactant in excess will remain after the reaction is over? 37.04 g
- 7) Solid calcium carbonate, CaCO_3 , is able to remove sulphur dioxide from waste gases by the reaction:
 $\text{CaCO}_3 + \text{SO}_2 + \text{other reactants} \rightarrow \text{CaSO}_3 + \text{other products}$
In a particular experiment, 255 g of CaCO_3 was exposed to 13.5 g of SO_2 in the presence of an excess amount of the other chemicals required for the reaction.
- What is the theoretical yield of CaSO_3 ? 253.2 g
 - If only 198 g of CaSO_3 was isolated from the products, what was the percentage yield of CaSO_3 in this experiment? 78.21%
- 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: 106.7 g

