

12-3 Practice Problems

12.3 Practice Problems (continued)

- Identify the limiting reactant when 1.22 g of  $O_2$  reacts with 1.05 g of  $H_2$  to produce water.  
 $O_2 + 2H_2 \rightarrow 2H_2O$
- Identify the limiting reactant when 4.68 g of Fe reacts with 2.88 g of S to produce  $FeS_2$ .  
 $1-2g H_2O$  9-10g  $H_2O$
- Identify the limiting reactant when 5.87 g of  $Mg(OH)_2$  reacts with 12.84 g of HCl to form  $MgCl_2$  and water.  
 $Mg(OH)_2 + 2HCl \rightarrow MgCl_2 + 2H_2O$
- Identify the limiting reactant when 6.25 g of  $AgNO_3$  reacts with 4.12 g of NaCl to form  $NaNO_3$  and  $AgCl$ .  
 $3.5-4g H_2O$  6-6.5g  $H_2O$
- Identify the limiting reactant when 7.81 g of HCl reacts with 5.24 g of NaOH to produce NaCl and  $H_2O$ .  
 $HCl + NaOH \rightarrow NaCl + H_2O$
- Identify the limiting reactant when 6.33 g of  $H_2SO_4$  reacts with 5.92 g of NaOH to produce  $Na_2SO_4$  and water.  
 $3.5-4g H_2O$  2-2.5g  $H_2O$
- Identify the limiting reactant when 43.25 g of  $CaC_2$  reacts with 33.71 g of water to produce  $Ca(OH)_2$  and  $C_2H_2$ .  
 $CaC_2 + 2H_2O \rightarrow Ca(OH)_2 + C_2H_2$   
17-18g  $C_2H_2$  23-27g  $C_2H_2$
- Identify the limiting reactant when 65.14 g of  $CaCl_2$  reacts with 74.68 g of  $Na_2CO_3$  to produce  $CaCO_3$  and NaCl.
- Identify the limiting reactant when 4.687 g of  $SF_4$  reacts with 6.281 g of  $I_2O_5$  to produce  $IF_5$  and  $SO_2$ .  
 $5SF_4 + 2I_2O_5 \rightarrow 4IF_5 + 5SO_2$
- If 4.1 g of Cr is heated with 9.3 g of  $Cl_2$ , what mass  $CrCl_3$  will be produced?  
 $3.5-3.9 g SO_2$  3-3.5g  $SO_2$
- What mass of  $SO_2$  is produced from the reaction between 31.5 g of  $S_8$  and 8.65 g of  $O_2$ ?  
 $5g + 8O_2 \rightarrow 8SO_2$
- What mass of  $SO_3$  is produced from the reaction of 12.4 g of  $SO_2$  and 3.45 g of  $O_2$ ?  
 $60-63g SO_2$  15-20g  $SO_2$
- What mass of  $H_2SO_4$  is produced from the reaction of 6.58 g of  $SO_3$  and 1.64 g of  $H_2O$ ?  
 $5g + H_2O \rightarrow H_2SO_4$
- What mass of  $CdS$  is produced if 8.47 g of cadmium reacts with 2.51 g of sulfur?  
 $8-8.5g H_2SO_4$  8.5-9g  $H_2SO_4$
- If 21.4 g of aluminum is reacted with 91.3 g of  $Fe_2O_3$ , the products will be  $Al_2O_3$  and iron. What mass of iron will be produced?  
 $2Al + Fe_2O_3 \rightarrow 2Al_2O_3 + 2Fe$   
40-45g Fe 60-65g Fe
- If 41.6 g of  $N_2O_4$  reacts with 20.8 g of  $N_2H_4$ , the products will be nitrogen and water. What mass of water will be produced?
- If 16.8 g of CO is mixed under high pressure with 1.78 g of  $H_2$ , what mass of methanol ( $CH_3OH$ ) will be produced?  
 $CO + 2H_2 \rightarrow CH_3OH$
- What mass of NaCl will be produced by the reaction of 58.7 g of NaI with 29.4 g of  $Cl_2$  gas if the products are sodium chloride and  $I_2$ ?  
 $15-20g CH_3OH$  10-15g  $CH_3OH$
- Determine the percent yield for the reaction between 3.74 g of Na and excess  $O_2$  if 5.34 g of  $Na_2O_2$  is recovered.  
 $2Na + O_2 \rightarrow Na_2O_2$
- Determine the percent yield for the reaction between 6.92 g of K and 4.28 g of  $O_2$  if 7.36 g of  $K_2O$  is produced.  
 $80-85%$
- Determine the percent yield for the reaction between 15.8 g of  $NH_3$  and excess oxygen to produce 21.8 g of NO gas and water.  
 $4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$
- Determine the percent yield for the reaction between 45.9 g of NaBr and excess chlorine gas to produce 12.8 g of NaCl and an unknown quantity of bromine gas.  
 $72-75%$
- Determine the percent yield for the reaction between 98.7 g of  $Sb_2S_3$  and excess oxygen if 72.4 g of  $Sb_2O_6$  is recovered along with an unknown amount of sulfur dioxide gas.  
 $75-80%$
- Determine the percent yield for the reaction between 46.5 g of ZnS and 13.3 g of oxygen if 18.4 g of ZnO is recovered along with an unknown quantity of sulfur dioxide.  
 $2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$
- Determine the percent yield for the reaction between 46.5 g of ZnS and 13.3 g of oxygen if 18.4 g of ZnO is recovered along with an unknown quantity of sulfur dioxide.  
 $43-46%$
- Determine the percent yield for the reaction between 46.5 g of ZnS and 13.3 g of oxygen if 18.4 g of ZnO is recovered along with an unknown quantity of sulfur dioxide.  
 $80-83%$