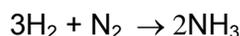


Chapter 8.3 and 8.4 book homework: 25, 27, 29, 31, 33, 35, 37, 43, 47, 49, 51, 53, 55 and 57

Chapter 9.5 book homework: 61, 63, 65, 67, 71, 73, 75, 77, 79 and 81

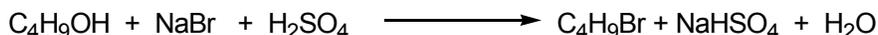
1. How many grams of solid sodium hydroxide are needed to make 500.0 mL of a 2.000 M NaOH solution?
 2. How many grams of calcium chloride are required to prepare a 250 mL solution with a concentration of 0.46 M?
 3. Calculate the molarity of a solution that contains 4.6 g of sodium chloride in 350 mL of solution.
 4. How many grams of potassium sulfate are needed to make 300.0 mL of a 0.062 M solution?
 5. A Chemistry student goes into the laboratory and takes 25.0 mL of 0.60 M HCl and **ADDS** 75.0 mL of water. What is the final concentration of the dilution?
 6. A 0.45 M solution of acetic acid with a volume of 10.0 ml was added to 153 ml of water. What is the new concentration of the acetic acid solution?
 7. A stock solution of sodium acetate was made with a concentration of 2.0 M. What volume of the stock solution and water must you add together to make 50.0 ml of a 0.80 M solution?
 8. If a 160 mL solution of 0.50 M HNO₃ is diluted to a total volume of 600.0 mL what is the molarity of the resulting solution?
 9. A laboratory method of preparing O₂ involves the decomposition of KClO₃ as seen by the following reaction. If a 12.8 g sample of KClO₃ is decomposed. How many
 - a) moles O₂ are produced
 - b) molecules of O₂ are produced
 - c) grams of KCl are produced
10. Refer to the equation $\text{CS}_2 + 2\text{CaO} \rightarrow \text{CO}_2 + 2\text{CaS}$
- A. How many moles of CO₂ can be obtained from the reaction of 4 moles of CS₂?
 - B. How many moles of CaO are consumed if 0.3 mole CS₂ reacts?
 - C. How many grams of CaS are produced if 53 g of CO₂ are produced?
 - D. How many grams of CaO are required to react completely with 38 g of CS₂?
11. Using the equation shown below, how many grams of ammonia will be formed if 75 grams of nitrogen reacts with excess hydrogen?





- A) How many moles of H_2 are produced from 64.4 g Fe.
B) How many grams of H_2O would be consumed if there were 76.3 g Fe
C) If 9.02 mol H_2 is produced what mass of Fe_3O_4 is also produced

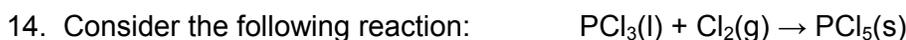
13. A laboratory manual calls for the use of 13.0 g $\text{C}_4\text{H}_9\text{OH}$, 21.6 g NaBr and 33.8 g H_2SO_4 as reactants in the following reaction:



A student who followed these directions obtained 16.8 g $\text{C}_4\text{H}_9\text{Br}$

What are

- A) the theoretical yield
B) the actual yield
C) the percent yield



Calculate the number of grams of $\text{PCl}_5(\text{s})$ produced from 55.8 g of $\text{PCl}_3(\text{l})$ if the percent yield is 78%.



If 2.50 g of $\text{NaN}_3(\text{s})$ react with excess $\text{NaNO}_3(\text{aq})$, 0.995 g of $\text{N}_2(\text{g})$ is recovered. What is the percent yield?



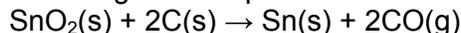
When 5.52 g of sodium react with 25.0g $\text{Al}_2\text{O}_3(\text{s})$, 1.00 g of $\text{Al}(\text{l})$ is produced. What is the percent yield?



When 500.0 g of $\text{WO}_3(\text{s})$ react with excess hydrogen, 375 g of $\text{W}(\text{s})$ are obtained. What is the percent yield?

18. If you had the same percent yield as in question 17, how many grams of WO_3 would you need to obtain 500.0 g of $\text{W}(\text{s})$?

19. How many grams of carbon monoxide gas are produced from the reaction of 5.00 moles of $\text{SnO}_2(\text{s})$ with 9.00 moles of carbon according to the equation below assuming 100% yield?



20. Considering the results from question 19, how many grams of CO would be obtained if the reaction only gave a 86% yield?

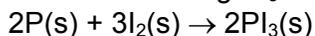


How many moles of nitric acid are produced starting from 231g of $\text{NO}_2(\text{g})$ and 36.2g of water?

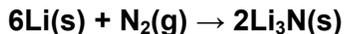
22. What would be the percent yield of the reaction in problem 21 if 180g of HNO_3 were obtained?

23. When a chemist mixed 0.334 L of 0.112 M sodium chloride with 2.12 L of 0.0343 M lead(II) nitrate, 4.98 g of lead(II) chloride was isolated. Calculate the % yield.

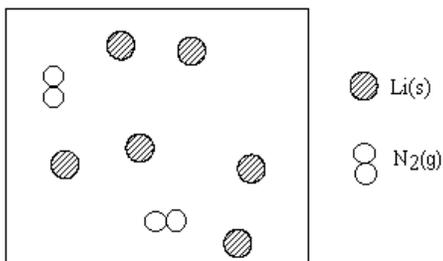
24. Phosphorus reacts with iodine as shown in the chemical reaction below. What is the percent yield of the reaction if 28.2 g PI_3 is obtained from the reaction of 48.0 g of I_2 with excess phosphorus?



25. Consider the reaction :



The following represents a mixture of Li(s) and $\text{N}_2\text{(g)}$ just before reaction occurs.



If each symbol represents 1 mole of Li(s) and 1 mole of $\text{N}_2\text{(g)}$, what is the limiting reactant and how many moles of the excess reactant remain after the reaction is complete?

26. What would be the percent yield if 28.0 g of Li_3N were obtained?

27. If you obtained the same yield of Li_3N as in problem 35 how many grams of N_2 would you need to start with to obtain the theoretical yield of Li_3N ?

ANSWERS:

- | | | | | |
|-----------------------------|---|---|-----------------------------|-------------------------|
| 1. 40.00 grams | 2. 13 grams | 3. 0.22 M | 4. 3.2 g | 5. 0.15 M |
| 6. 0.28 M | 7. 20 mL of sodium acetate solution and 30 mL of H_2O | 8. 0.13 M | | |
| 9A) 0.157 mol O_2 | B) 9.43×10^{22} molec O_2 | C) 7.79g KCl | | |
| 10A) 4 moles | B. 0.6 mole | C. 170 g | D. 56 g | 11. 91 g |
| 12.A) 1.54 mol H_2 | B) 32.8 g H_2O | C) 522 g Fe_3O_4 | 13. A) 24.3g | B) 16.8g |
| C) 69% | 14. 65.9 g PCl_5 | 15. 57.7% | 16. 46.3% | 17. 94.6% |
| 18. 672 g WO_3 | 19. 252 g CO | 20 217 g CO | 21. 3.33 mol HNO_3 | 22. 86% |
| 23. 95.8% | 24. 54.3% | 25. Li(s) , 1 mol $\text{N}_2\text{(g)}$ | 26. 40% | 27. 70.0 g N_2 |