

Chem 11 – Stoichiometry Calculations

Name _____

Show your work, circle your answers.



a. How many moles of oxygen are needed to react with 6.5 moles of ammonia?

b. What mass of NH_3 is needed to react with 0.500 moles of O_2 ?

c. What mass of NO will be produced when 10.0 g of O_2 react?

d. How many molecules of H_2O are formed when 8.0 g of O_2 react?

e. How many moles of NH_3 are needed to react with 3.5×10^{22} molecules of O_2 ?

3. Given the balanced equation



a. How many moles of H_2 are needed to make 1.00 moles of NH_3 ?

b. What mass of NH_3 is produced from 0.500 moles of N_2 ?

c. What mass of N_2 is needed to react with 10.0 g of H_2 ?

d. When 5.00×10^{-3} g of H_2 react, how many molecules of NH_3 are produced?

4. Given the balanced equation $2\text{C}_5\text{H}_{11}\text{OH}_{(g)} + 15\text{O}_{2(g)} \rightarrow 10\text{CO}_{2(g)} + 12\text{H}_2\text{O}_{(g)}$, at STP,

a. What volume of oxygen is needed to react with 2.0 litres of $\text{C}_5\text{H}_{11}\text{OH}_{(g)}$?

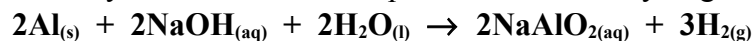
b. What volume of oxygen is needed to react with 0.45 L $\text{C}_5\text{H}_{11}\text{OH}_{(g)}$?

c. What volume of oxygen is needed to produce 15 L $\text{H}_2\text{O}_{(g)}$?

d. What volume of oxygen is needed to produce 64 g $\text{CO}_{2(g)}$?

- e. What volume of oxygen is needed to produce 3.8×10^{26} molecules of water?
- f. What volume of oxygen is needed to react with 19 mol $C_5H_{11}OH_{(g)}$?
5. Given the balanced equation $4 NH_{3(g)} + 5 O_{2(g)} \rightarrow 6 H_2O_{(g)} + 4 NO_{(g)}$
- a. What volume of $O_{2(g)}$ is required to react with 20.3 L of $NH_{3(g)}$ at STP?
- b. What volume of $NH_{3(g)}$ at STP is required to produce 1.20 moles of $H_2O_{(g)}$?
6. Given the balanced equation below, what volume of 3.00 M hydrochloric acid is required to react with 12.4 g of zinc?
- $$Zn_{(s)} + 2HCl_{(aq)} \rightarrow ZnCl_{2(aq)} + H_{2(g)}$$
7. What volume of 0.250 M $HCl_{(aq)}$ is required to completely neutralise 25.0 mL of 0.318 M $NaOH_{(aq)}$?

8. Excess aluminum metal is reacted with 3.00 M NaOH_(aq) according to the balanced reaction shown below. What volume of sodium hydroxide is needed to produce 50.0 L of hydrogen gas @ STP?



9. Given the balanced reaction $\text{H}_3\text{PO}_{4(aq)} + 2\text{KOH}_{(aq)} \rightarrow 2\text{HOH}_{(l)} + \text{K}_2\text{HPO}_{4(aq)}$, 19.8 mL of $\text{H}_3\text{PO}_{4(aq)}$ react with 25.0 mL of 0.500 M $\text{KOH}_{(aq)}$. What is the molarity of the $\text{H}_3\text{PO}_{4(aq)}$?

10. 50.0 mL of sulphuric acid react with 24.4 mL of 2.20 M aqueous ammonia solution to produce ammonium sulphate. What is the concentration of the sulphuric acid?

11. What volume of 0.0250 M calcium hydroxide is needed to react completely with 25.0 mL of 0.125 M aluminum sulphate solution?