

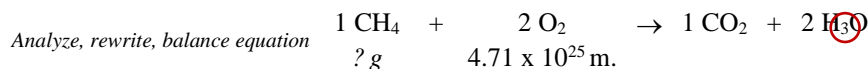
Exercise 9.2b

Stoichiometry Errors - Answers

Name: _____

Date: _____ Per: _____

4. Given the equation, $\text{CH}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$, what mass of methane (CH_4) is needed to completely react with 4.71×10^{25} molecules of oxygen? (6)



Solve for only given

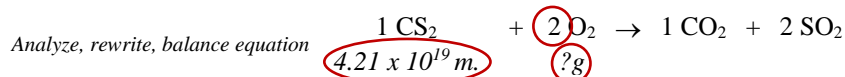
$$\frac{4.03 \times 10^{23} \text{ p. O}_2}{6.022 \times 10^{23} \text{ p. O}_2} \times \frac{2 \text{ mol O}_2}{1 \text{ mol O}_2} \times \frac{1 \text{ mol CH}_4}{1 \text{ mol O}_2} \times \frac{231.837 \text{ g CH}_4}{1 \text{ mol CH}_4} = 627 \text{ g CH}_4$$



Solve for only given

$$\frac{4.71 \times 10^{25} \text{ p. O}_2}{6.022 \times 10^{23} \text{ p. O}_2} \times \frac{1 \text{ mol O}_2}{2 \text{ mol O}_2} \times \frac{1 \text{ mol CH}_4}{1 \text{ mol O}_2} \times \frac{16.043 \text{ g CH}_4}{1 \text{ mol CH}_4} = 627 \text{ g CH}_4$$

5. Given the equation, $\text{CS}_2 + \text{O}_2 \rightarrow \text{CO}_2 + \text{SO}_2$, how many grams of carbon disulfide will react with 4.21×10^{19} molecules of oxygen? (5)



Solve for only reactant

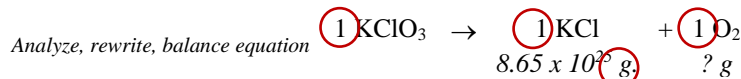
$$\frac{4.21 \times 10^{19} \text{ m. O}_2}{6.022 \times 10^{23} \text{ m. O}_2} \times \frac{1 \text{ mol O}_2}{1 \text{ mol O}_2} \times \frac{1 \text{ mol CS}_2}{1 \text{ mol O}_2} \times \frac{76.141 \text{ g CS}_2}{1 \text{ mol CS}_2} = 1.77 \text{ g CS}_2$$



Solve for only reactant

$$\frac{4.21 \times 10^{19} \text{ m. O}_2}{6.022 \times 10^{23} \text{ m. O}_2} \times \frac{1 \text{ mol O}_2}{3 \text{ mol O}_2} \times \frac{1 \text{ mol CS}_2}{1 \text{ mol O}_2} \times \frac{76.141 \text{ g CS}_2}{1 \text{ mol CS}_2} = 1.77 \times 10^{-3} \text{ g CS}_2$$

6. Given the equation, $\text{KClO}_3 \rightarrow \text{KCl} + \text{O}_2$, if 8.65×10^{25} formula units of potassium chloride are produced, what mass of oxygen is produced? (9)



Solve for only reactant

$$\frac{8.65 \times 10^{25} \text{ p. KCl}}{6.022 \times 10^{23} \text{ p. KCl}} \times \frac{1 \text{ mol KCl}}{1 \text{ mol KCl}} \times \frac{1 \text{ mol O}_2}{1 \text{ mol KCl}} \times \frac{15.999 \text{ g O}}{1 \text{ mol O}} = 6890 \text{ g O}$$



Solve for only reactant

$$\frac{8.65 \times 10^{25} \text{ p. KCl}}{6.022 \times 10^{23} \text{ p. KCl}} \times \frac{1 \text{ mol KCl}}{2 \text{ mol KCl}} \times \frac{3 \text{ mol O}_2}{2 \text{ mol KCl}} \times \frac{31.998 \text{ g O}_2}{1 \text{ mol O}_2} = 6890 \text{ g O}_2$$

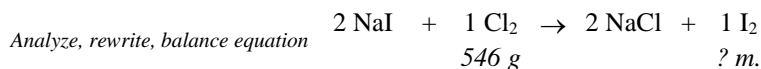
Exercise 9.2b

Stoichiometry Errors - Answers

Name: _____

Date: _____ Per: _____

7. Given the equation, $\text{NaI} + \text{Cl}_2 \rightarrow \text{NaCl} + \text{I}_2$, how many molecules of iodine are liberated if 546 g of chlorine react with excess sodium iodide? (4)



Solve for only reactant

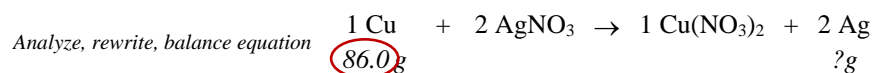
$$\frac{546 \text{ g Cl}_2}{1} \times \frac{1 \text{ mol Cl}_2}{70.906 \text{ g Cl}_2} \times \frac{1 \text{ mol Cl}_2}{1 \text{ mol I}_2} \times \frac{258.30 \text{ g I}_2}{1 \text{ mol I}_2} = 1950 \text{ g I}_2$$



Solve for only reactant

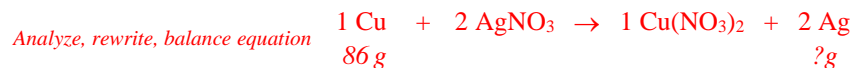
$$\frac{546 \text{ g Cl}_2}{1} \times \frac{1 \text{ mol Cl}_2}{70.906 \text{ g Cl}_2} \times \frac{1 \text{ mol I}_2}{1 \text{ mol Cl}_2} \times \frac{6.022 \times 10^{23} \text{ m. I}_2}{1 \text{ mol I}_2} = 4.64 \times 10^{24} \text{ m. I}_2$$

8. Given the equation, $\text{Cu} + \text{AgNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + \text{Ag}$, how many grams of silver will be produced if 86 g of copper are used? (5)



Solve for only reactant

$$\frac{86.0 \text{ g Cu}}{1} \times \frac{1 \text{ mol Cu}}{6.022 \times 10^{23} \text{ p. Cu}} \times \frac{2 \text{ mol Ag}}{1 \text{ mol Cu}} \times \frac{107.87 \text{ g Ag}}{2 \text{ mol Ag}} = 292 \text{ g Ag}$$



Solve for only reactant

$$\frac{86 \text{ g Cu}}{1} \times \frac{1 \text{ mol Cu}}{63.546 \text{ g Cu}} \times \frac{2 \text{ mol Ag}}{1 \text{ mol Cu}} \times \frac{107.87 \text{ g Ag}}{1 \text{ mol Ag}} = 290 \text{ g Ag}$$