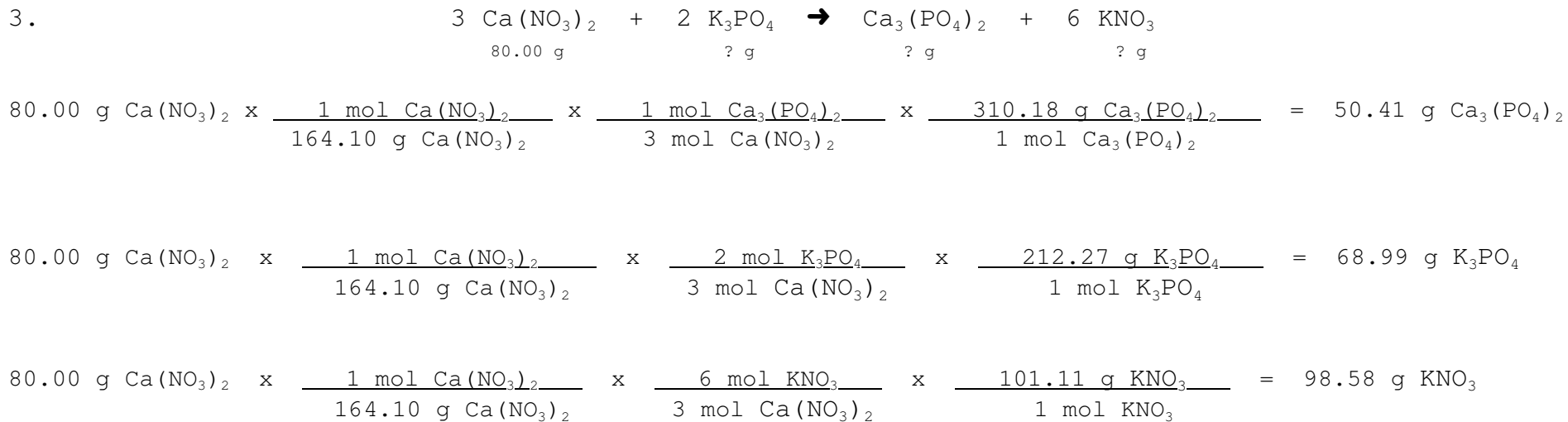
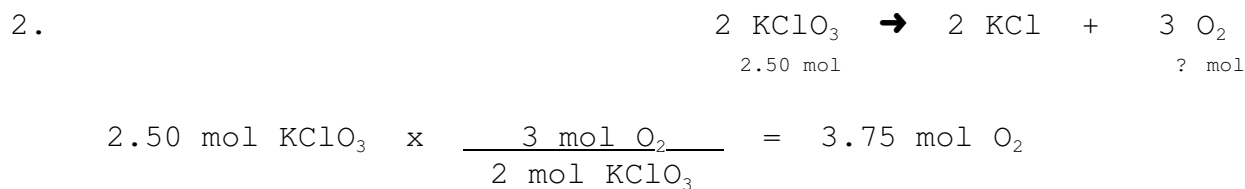
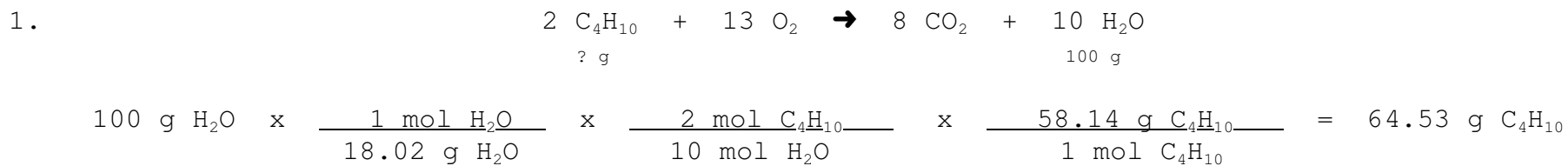


STOICHIOMETRIC PROBLEMS #2B - ANSWERS



4. mass reactants = mass $\text{Ca}(\text{NO}_3)_2$ + mass K_3PO_4
= 80.00 g + 68.99 g
= 148.99 g

mass products = mass $\text{Ca}_3(\text{PO}_4)_2$ + mass KNO_3
= 50.41 g + 98.58 g
= 148.99 g

The mass of reactants and products are the same (or nearly the same). This makes sense, since the law of conservation of mass states that matter cannot be created nor destroyed, therefore mass is conserved.



$$25.0 \text{ g Al}_2\text{O}_3 \times \frac{1 \text{ mol Al}_2\text{O}_3}{101.96 \text{ g Al}_2\text{O}_3} \times \frac{2 \text{ mol Al}(\text{OH})_3}{1 \text{ mol Al}_2\text{O}_3} \times \frac{78.01 \text{ g Al}(\text{OH})_3}{1 \text{ mol Al}(\text{OH})_3} = 38.3 \text{ g Al}(\text{OH})_3$$

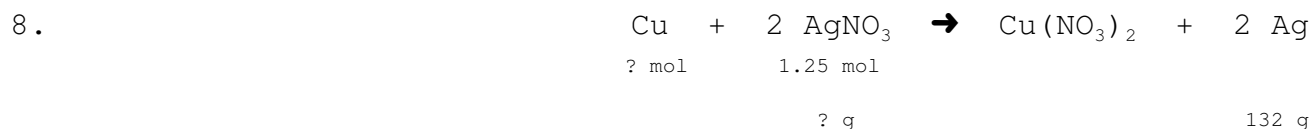


$$35.0 \text{ g CuO} \times \frac{1 \text{ mol CuO}}{79.55 \text{ g CuO}} \times \frac{2 \text{ mol Cu}_2\text{O}}{4 \text{ mol CuO}} \times \frac{143.10 \text{ g Cu}_2\text{O}}{1 \text{ mol Cu}_2\text{O}} = 31.5 \text{ g Cu}_2\text{O}$$



$$11.0 \text{ mol Ca}(\text{ClO}_3)_2 \times \frac{3 \text{ mol O}_2}{1 \text{ mol Ca}(\text{ClO}_3)_2} = 33.0 \text{ mol O}_2$$

$$11.0 \text{ mol Ca}(\text{ClO}_3)_2 \times \frac{1 \text{ mol CaCl}_2}{1 \text{ mol Ca}(\text{ClO}_3)_2} \times \frac{110.98 \text{ g CaCl}_2}{1 \text{ mol CaCl}_2} = 1220 \text{ g CaCl}_2$$

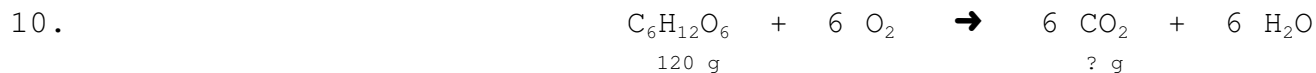


$$1.25 \text{ mol AgNO}_3 \times \frac{1 \text{ mol Cu}}{2 \text{ mol AgNO}_3} = 0.625 \text{ mol Cu}$$

$$132 \text{ g Ag} \times \frac{1 \text{ mol Ag}}{107.87 \text{ g Ag}} \times \frac{2 \text{ mol AgNO}_3}{2 \text{ mol Ag}} \times \frac{169.88 \text{ g AgNO}_3}{1 \text{ mol AgNO}_3} = 208 \text{ g AgNO}_3$$



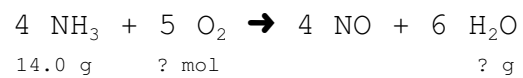
$$\begin{array}{l} 25.0 \text{ kg Fe}_2\text{O}_3 \times \frac{1000 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ mol Fe}_2\text{O}_3}{159.70 \text{ g Fe}_2\text{O}_3} \times \frac{2 \text{ mol Fe}}{1 \text{ mol Fe}_2\text{O}_3} \\ \times \frac{55.85 \text{ g Fe}}{1 \text{ mol Fe}} \times \frac{1 \text{ kg}}{1000 \text{ g}} = 17.5 \text{ kg Fe} \end{array}$$



$$120 \text{ g C}_6\text{H}_{12}\text{O}_6 \times \frac{1 \text{ mol C}_6\text{H}_{12}\text{O}_6}{180.18 \text{ g C}_6\text{H}_{12}\text{O}_6} \times \frac{6 \text{ mol CO}_2}{1 \text{ mol C}_6\text{H}_{12}\text{O}_6} \times \frac{44.01 \text{ g CO}_2}{1 \text{ mol CO}_2} = 176 \text{ g CO}_2$$

The mass of oxygen added to carbon in carbon dioxide gives this product more mass when compared to the mass of oxygen (and hydrogen) added to the carbon in glucose.

11.



$$14.0 \text{ g NH}_3 \times \frac{1 \text{ mol NH}_3}{17.04 \text{ g NH}_3} \times \frac{6 \text{ mol H}_2\text{O}}{4 \text{ mol NH}_3} \times \frac{18.02 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 22.2 \text{ g H}_2\text{O}$$

$$14.0 \text{ g NH}_3 \times \frac{1 \text{ mol NH}_3}{17.04 \text{ g NH}_3} \times \frac{5 \text{ mol O}_2}{4 \text{ mol NH}_3} = 1.03 \text{ mol O}_2$$
