

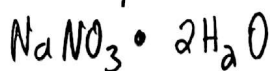
# KEY

## GROUP QUIZ UNIT 08

1. C      2. B      3. D      4. B      5. B  
 6. A      7. D      8. B      9. D      10. B

Workout problems: Show ALL work here!

11. 2-step



$$\% \text{ salt} = \frac{\text{NaN}_3}{\text{NaNO}_3 \cdot 2\text{H}_2\text{O}} \times 100 = \frac{85.01 \text{ g/mol}}{121.05 \text{ g/mol}} \cdot 100$$

$$\left. \begin{array}{l} 70.23\% \text{ salt } \left\{ \begin{array}{l} (\% \text{ decimal}) \text{ (total mass)} \\ (0.7023)(55 \text{ g}) \end{array} \right. \\ = 38.63 \text{ g salt in sample} \end{array} \right\}$$

12.

$$\left. \begin{array}{l} 4.175 \text{ g sample} \\ - 3.120 \text{ g salt} \\ \hline 1.055 \text{ g water} \end{array} \right\} \begin{array}{l} 3.12 \text{ g CuSO}_4 \cdot \frac{1 \text{ mol CuSO}_4}{159.61 \text{ g CuSO}_4} = 0.0195 \text{ mol} \\ 1.055 \text{ g H}_2\text{O} \cdot \frac{1 \text{ mol H}_2\text{O}}{18.02 \text{ g H}_2\text{O}} = 0.0585 \text{ mol} \end{array} \left\{ \begin{array}{l} n = \frac{\text{mol water}}{\text{mol salt}} = \frac{0.0585 \text{ mol}}{0.0195 \text{ mol}} = 3 \\ \text{CuSO}_4 \cdot 3 \text{H}_2\text{O} \end{array} \right.$$

$$13. 120.0 \text{ g Na} \cdot \frac{1 \text{ mol Na}}{23 \text{ g Na}} \cdot \frac{1 \text{ mol H}_2}{2 \text{ mol Na}} \cdot \frac{2.02 \text{ g H}_2}{1 \text{ mol H}_2} = 5.27 \text{ g H}_2$$

$$80.0 \text{ g H}_2\text{O} \cdot \frac{1 \text{ mol H}_2\text{O}}{18.02 \text{ g H}_2\text{O}} \cdot \frac{1 \text{ mol H}_2}{2 \text{ mol H}_2\text{O}} \cdot \frac{2.02 \text{ g H}_2}{1 \text{ mol H}_2} = 4.48 \text{ g H}_2 \leftarrow \text{LR}$$

14.

$$1.44 \times 10^{23} \text{ molecule Fe}_2\text{O}_3 \cdot \frac{1 \text{ mol Fe}_2\text{O}_3}{6.02 \times 10^{23} \text{ molecule Fe}_2\text{O}_3} \cdot \frac{3 \text{ mol O}_2}{2 \text{ mol Fe}_2\text{O}_3} \cdot \frac{22.4 \text{ L O}_2}{1 \text{ mol O}_2} = 8.04 \text{ L O}_2$$

15.

$$100.0 \text{ g Zn} \cdot \frac{1 \text{ mol Zn}}{65.38 \text{ g Zn}} \cdot \frac{2 \text{ mol ZnO}}{2 \text{ mol Zn}} \cdot \frac{81.38 \text{ g ZnO}}{1 \text{ mol ZnO}} = 124.47 \text{ g ZnO} \leftarrow \text{Max!}$$

$$65.8 \text{ L O}_2 \cdot \frac{1 \text{ mol O}_2}{22.4 \text{ L O}_2} \cdot \frac{2 \text{ mol ZnO}}{1 \text{ mol O}_2} \cdot \frac{81.38 \text{ g ZnO}}{1 \text{ mol ZnO}} = 478.11 \text{ g ZnO}$$

16.

$$\text{Actual} = 121 \text{ g H}_2\text{O}$$

$$105 \text{ g C}_3\text{H}_8 \cdot \frac{1 \text{ mol C}_3\text{H}_8}{44.11 \text{ g C}_3\text{H}_8} \cdot \frac{4 \text{ mol H}_2\text{O}}{1 \text{ mol C}_3\text{H}_8} \cdot \frac{18.02 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 171.62 \text{ g H}_2\text{O}$$

$$\left. \begin{array}{l} \% = \frac{A}{T} \cdot 100 \\ \% = \frac{121 \text{ g H}_2\text{O}}{171.62 \text{ g H}_2\text{O}} \cdot 100 \\ = 70.50 \% \end{array} \right\}$$