

Key for Quiz 6

1.)
$$\frac{0.900 \text{ J}}{\text{g} \cdot ^\circ\text{C}} \mid \frac{26.98 \text{ g}}{\text{mol}} \mid \frac{10.5 \text{ mol}}{\text{mol}} \mid 194.5 ^\circ\text{C}} = \begin{matrix} 49600 \text{ J} \\ 49.6 \text{ kJ} \end{matrix}$$

2.)
$$\frac{3.8 \text{ g}}{\text{g} \cdot ^\circ\text{C}} \mid \frac{0.900 \text{ J}}{\text{g} \cdot ^\circ\text{C}} \mid 425.0 ^\circ\text{C}} = 1453 \text{ J}$$

3.)
$$\frac{2500 \text{ J}}{0.285 \text{ g}} \mid \frac{\text{g} \cdot ^\circ\text{C}}{\text{g} \cdot ^\circ\text{C}} \mid 22.0 \text{ g}} = \begin{matrix} 295 \Delta T ^\circ\text{C} \\ + 45 \\ 340 ^\circ\text{C} \end{matrix}$$

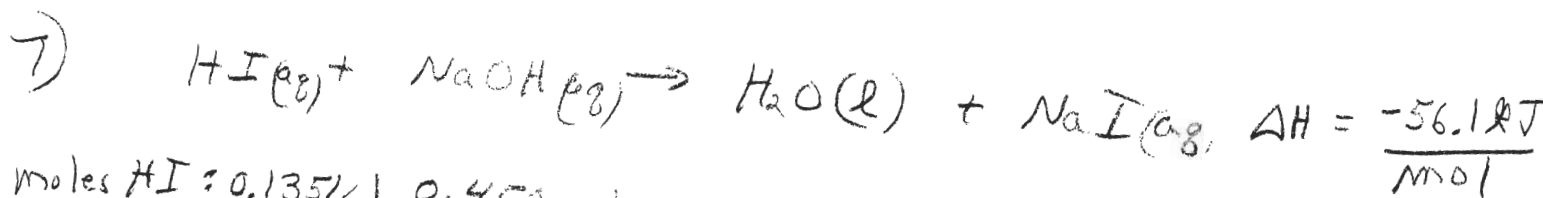
5.)
$$\frac{1.00 \times 10^4 \text{ kJ}}{5314 \text{ kJ}} \mid \frac{8 \text{ mol CO}_2}{\text{mol}} \mid \frac{44.01 \text{ g}}{\text{mol}} = 662 \text{ g}$$

6.)
$$\frac{10.1 \text{ g}}{56.08 \text{ g}} \mid \frac{\text{mol}}{\text{mol}} \mid \frac{64.8 \text{ kJ}}{\text{mol}} = 11.67 \text{ kJ}$$

$$\frac{11.67 \times 10^3 \text{ J}}{4.18 \text{ J}} \mid \frac{\text{g} \cdot ^\circ\text{C}}{\text{g} \cdot ^\circ\text{C}} \mid \frac{167.1 \text{ g}}{\text{g}} = \begin{matrix} 16.7 ^\circ\text{C} \\ + 18.0 \\ 34.7 ^\circ\text{C} \end{matrix}$$

or without the 10 g of CO

$$\begin{matrix} 17.8 \\ + 18 \\ \hline 35.7 ^\circ\text{C} \end{matrix}$$



$$\text{moles HI} = \frac{0.135 \cancel{\text{L}}}{\cancel{\text{L}}} \times \frac{0.450 \text{ mol}}{\cancel{\text{L}}} = 0.06075 \text{ mol HI}$$

$$\text{moles NaOH} = \frac{0.145 \cancel{\text{L}}}{\cancel{\text{L}}} \times \frac{0.500 \text{ mol}}{\cancel{\text{L}}} = 0.0725 \text{ mol NaOH}$$

HI is the limiting reactant:

$$\frac{0.06075 \text{ mol HI}}{\cancel{\text{mol HI}}} \times \frac{56.1 \text{ kJ}}{\cancel{\text{mol HI}}} = 3.408 \text{ kJ Heat released}$$

$$\frac{3.408 \times 10^3 \text{ J}}{\cancel{\text{J}}} \times \frac{\cancel{\text{g}} \cdot ^\circ\text{C}}{4.18 \cancel{\text{J}}} \times \frac{1}{280 \cancel{\text{g}}} = 2.91 \text{ } ^\circ\text{C}$$

$$\text{final temp} = 23.15^\circ\text{C} + 2.91^\circ\text{C} = \underline{\underline{26.06^\circ\text{C}}}$$