

# Practice FRQ (2004 Form B)

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October 29, 2020

1. (1)

$$\begin{aligned}85.7\%_{\text{C}} &= 14.3\%_{\text{H}} \\m_{\text{C}} &= 12 \left[ \frac{\text{g}}{\text{mol}} \right] \\m_{\text{H}} &= 1 \left[ \frac{\text{g}}{\text{mol}} \right] \\85.7 \frac{1}{12} &= 7.14 [\text{mol}_{\text{C}}] \\14.3 \frac{1}{1} &= 14.3 [\text{mol}_{\text{H}}] \\ \frac{7.14}{7.14} &= 1 [\text{C}] \\ \frac{14.3}{7.14} &= 2 [\text{H}] \\ &= \text{CH}_2\end{aligned} \tag{1}$$

2. (a) (2)

$$\begin{aligned}\frac{2}{x} &= \frac{n}{V} \\ \frac{2}{x} &= \frac{.948}{.0821 \cdot 323} \\ x &\approx 56 \left[ \frac{\text{g}}{\text{mol}} \right]\end{aligned} \tag{2}$$

(b) (3)

$$\begin{aligned}m_{\text{molar}} &= 56 = 4(14) \\ \therefore &\rightarrow \text{C}_4\text{H}_8\end{aligned} \tag{3}$$

3. (4)

$$\begin{aligned}
 P_0 V_0 &= P_f V_f \\
 3 \cdot 5 &= (5 + 1) P_f \\
 P_f &= \frac{15}{6} \\
 &= 2.5[atm] \\
 .55 \cdot 1 &= (5 + 1) P_f \\
 P_f &= \frac{.55}{6} \\
 &= .0917[atm] \\
 P_{total} &= 2.5 + .0917 \\
 &= 2.6[atm]
 \end{aligned}
 \tag{4}$$

4. (5)

$$\begin{aligned}
 m_{C_8H_{18}} &= 255 \cdot .703 \\
 &= 179.265[g] \\
 mol_{C_8H_{18}} &= \frac{179.265}{114} \\
 &= 1.57[mol_{C_8H_{18}}] \\
 17 \cdot 1.57 &= 26.7[mol]
 \end{aligned}
 \tag{5}$$