Samples **Avogadro's Law SOLUTIONS**

1. The chemical equation is: $3O_2(g) \rightarrow 2O_3(g)$

$$\begin{aligned}\text{The number of moles } O_3 \text{ produced} &= 8.80\text{mol } O_2 \times \frac{2\text{mol } O_3}{3\text{mol } O_2} \\ &= 5.87\text{mol } O_3\end{aligned}$$

$$\begin{aligned}\text{Since } V/n \text{ is constant, } \frac{V_1}{n_1} &= \frac{V_2}{n_2} \\ \therefore V_2 &= \frac{n_2}{n_1} \times V_1 \\ &= \frac{5.87\text{mol}}{8.80\text{mol}} \times 11.2\text{L} \\ &= 7.5\text{L}\end{aligned}$$

2. The chemical equation is: $3O_2(g) \rightarrow 2O_3(g)$

$$\begin{aligned}\text{The number of moles } O_3 \text{ produced} &= 2.90\text{mol } O_2 \times \frac{2\text{mol } O_3}{3\text{mol } O_2} \\ &= 1.93\text{mol } O_3\end{aligned}$$

$$\begin{aligned}\text{Since } V/n \text{ is constant, } \frac{V_1}{n_1} &= \frac{V_2}{n_2} \\ \therefore V_2 &= \frac{n_2}{n_1} \times V_1 \\ &= \frac{1.93\text{mol}}{2.90\text{mol}} \times 19.2\text{L} \\ &= 12.8\text{L}\end{aligned}$$

3. The chemical equation is: $3O_2(g) \rightarrow 2O_3(g)$

$$\begin{aligned}\text{The number of moles } O_3 \text{ produced} &= 9.50\text{mol } O_2 \times \frac{2\text{mol } O_3}{3\text{mol } O_2} \\ &= 6.33\text{mol } O_3\end{aligned}$$

$$\begin{aligned}\text{Since } V/n \text{ is constant, } \frac{V_1}{n_1} &= \frac{V_2}{n_2} \\ \therefore V_2 &= \frac{n_2}{n_1} \times V_1 \\ &= \frac{6.33\text{mol}}{9.50\text{mol}} \times 6.1\text{L} \\ &= 4.1\text{L}\end{aligned}$$