

## Molar Volume 2-step conversions Practice Problems

① volume  $\xrightarrow{①}$  mole  $\xrightarrow{②}$  particle

$$① 91.6 \text{ L } N_2 \times \frac{1 \text{ mol}}{22.4 \text{ L}} = 4.09 \text{ mol } N_2$$

$$② 4.09 \text{ mol } N_2 \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} = 2.46 \times 10^{24} \text{ molecules } N_2$$

② volume  $\xrightarrow{①}$  mole  $\xrightarrow{②}$  mass

$$① 3.4 \text{ L He} \times \frac{1 \text{ mol}}{22.4 \text{ L}} = 0.15 \text{ mol He}$$

$$② 0.15 \text{ mol He} \times \frac{4.00 \text{ g}}{1 \text{ mol}} = 0.6 \text{ g He}$$

③ mass  $\xrightarrow{①}$  mole  $\xrightarrow{②}$  volume

$$386 \text{ g } CO_2 \times \frac{1 \text{ mol}}{44.01 \text{ g}} = 8.77 \text{ mol } CO_2$$

$$\begin{array}{l} CO_2 \\ 1 \times C = 1 \times 12.01 \text{ g/mol} = 12.01 \\ 2 \times O = 2 \times 16.00 \text{ g/mol} = 32.00 \\ \hline 44.01 \text{ g/mol} \end{array}$$

$$8.77 \text{ mol } CO_2 \times \frac{22.4 \text{ L}}{1 \text{ mol}} = 196.45 \text{ L } CO_2$$

④ particles  $\xrightarrow{①}$  moles  $\xrightarrow{②}$  volume

$$① 5.82 \times 10^{25} \text{ molecules } O_2 \times \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molecules}} = 96.68 \text{ mol } O_2$$

$$② 96.68 \text{ mol } O_2 \times \frac{22.4 \text{ L}}{1 \text{ mol}} = 2165.6 \text{ L } O_2$$