## Gas Stoichiometry Practice

For all of these problems, assume that the reactions are being performed at a pressure of 1.0 atm and a temperature of 298 K .

1) Calcium carbonate decomposes at high temperatures to form carbon dioxide and calcium oxide:

$$
\mathrm{CaCO}_{3(\mathrm{~s})} \rightarrow \mathrm{CO}_{2(\mathrm{~g})}+\mathrm{CaO}_{(\mathrm{s})}
$$

How many grams of calcium carbonate will I need to form 3.45 liters of carbon dioxide?
2) Ethylene burns in oxygen to form carbon dioxide and water vapor:

$$
\mathrm{C}_{2} \mathrm{H}_{4(\mathrm{~g})}+3 \mathrm{O}_{2(\mathrm{~g})} \rightarrow 2 \mathrm{CO}_{2(\mathrm{~g})}+2 \mathrm{H}_{2} \mathrm{O}_{(\mathrm{g})}
$$

How many liters of water can be formed if 1.25 liters of ethylene are consumed in this reaction?
3) When chlorine is added to acetylene, 1,1,2,2-tetrachloroethane is formed:

$$
2 \mathrm{Cl}_{2(\mathrm{~g})}+\mathrm{C}_{2} \mathrm{H}_{2(\mathrm{~g})} \rightarrow \mathrm{C}_{2} \mathrm{H}_{2} \mathrm{Cl}_{4(\mathrm{l})}
$$

How many liters of chlorine will be needed to make 75.0 grams of $\mathrm{C}_{2} \mathrm{H}_{2} \mathrm{Cl}_{4}$ ?

## Gas Stoichiometry Practice - Solutions

For all of these problems, assume that the reactions are being performed at a pressure of 1.0 atm and a temperature of 298 K .

1) Calcium carbonate decomposes at high temperatures to form carbon dioxide and calcium oxide:

$$
\mathrm{CaCO}_{3(\mathrm{~s})} \rightarrow \mathrm{CO}_{2(\mathrm{~g})}+\mathrm{CaO}_{(\mathrm{s})}
$$

How many grams of calcium carbonate will I need to form 3.45 liters of carbon dioxide?
14.1 grams
2) Ethylene burns in oxygen to form carbon dioxide and water vapor:

$$
\mathrm{C}_{2} \mathrm{H}_{4(\mathrm{~g})}+3 \mathrm{O}_{2(\mathrm{~g})} \rightarrow 2 \mathrm{CO}_{2(\mathrm{~g})}+2 \mathrm{H}_{2} \mathrm{O}_{(\mathrm{g})}
$$

How many liters of water can be formed if 1.25 liters of ethylene are consumed in this reaction?
2.50 liters
3) When chlorine is added to acetylene, 1,1,2,2-tetrachloroethane is formed:

$$
2 \mathrm{Cl}_{2(\mathrm{~g})}+\mathrm{C}_{2} \mathrm{H}_{2(\mathrm{~g})} \rightarrow \mathrm{C}_{2} \mathrm{H}_{2} \mathrm{Cl}_{4(\mathrm{l})}
$$

How many liters of chlorine will be needed to make 75.0 grams of $\mathrm{C}_{2} \mathrm{H}_{2} \mathrm{Cl}_{4}$ ?
21.8 L

