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.

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

$$CaCO_{3(s)} \rightarrow CO_{2(g)} + CaO_{(s)}$$

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:

$$C_2H_{4(g)} + 3 O_{2(g)} \rightarrow 2 CO_{2(g)} + 2 H_2O_{(g)}$$

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:

$$2 CI_{2(g)} + C_2H_{2(g)} \rightarrow C_2H_2CI_{4(l)}$$

How many liters of chlorine will be needed to make 75.0 grams of $C_2H_2Cl_4$?

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.

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

$$CaCO_{3(s)} \rightarrow CO_{2(g)} + CaO_{(s)}$$

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:

$$C_2H_{4(g)} + 3 O_{2(g)} \rightarrow 2 CO_{2(g)} + 2 H_2O_{(g)}$$

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:

$$2 CI_{2(g)} + C_2H_{2(g)} \rightarrow C_2H_2CI_{4(l)}$$

How many liters of chlorine will be needed to make 75.0 grams of $C_2H_2CI_4$?

21.8 L