

Exercise 7.5 Stoichiometry Practice

1. Calcium carbonate (CaCO_3) reacts with aqueous hydrochloric acid (HCl). Calculate the volume of carbon dioxide gas that can be obtained by adding 25.5 g of calcium carbonate to 225 mL of 1.65 M $\text{HCl}_{(\text{aq})}$ at 20.5 °C and 92.7 kPa.

Give your answer both in L and in m^3

2. Thallium(III) oxide decomposes to thallium(I) oxide and oxygen gas at temperatures above 700 °C.
 - (a) Write a balanced chemical equation for this reaction. (*Thallium = Tl*)
 - (b) You have an impure sample of thallium(III) oxide. In a lab, you heat 65 grams of the impure sample to 750 °C (atmospheric pressure = 88100 Pa). The oxygen generated is collected in a balloon and measured to have a volume of 1.6 L at 22.5 °C. What was the mass of pure thallium(III) oxide in the original sample?