

Molar Volume Practice Exercises

1. How many moles of nitrogen gas are in 50 L at STP? **2.2 L**
2. How many grams of nitrogen gas are in 100 L at STP?
3. How many particles of oxygen gas are in 65 L at STP? **1.7×10^{24}**
4. How many liters are in 0.25 moles of nitrogen dioxide at STP?
5. How many grams are in 0.5 liter of neon gas at STP? **0.4 g**
6. How many liters are in 9.4×10^{25} molecules of methane gas at STP?
7. 0.25 liters of CH_4 at STP would comprise of how many molecules? **6.7×10^{21} molecules**
8. If a sample of xenon gas is 5 grams, what volume would this gas occupy at STP?
9. What would happen to the volume in #8 if the temperature were increased? What would happen to the mass of Xe?
10. What would happen to the volume in #8 if the pressure were decreased? What would happen to the mass of Xe?
11. How many liters of ammonia gas, NH_3 , are produced when 44.8 L of nitrogen reacts with hydrogen at STP? **89.6 L**
12. How many grams of methane are required to produce 75 L of carbon dioxide at STP?
$$\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$$
13. How many liters of carbon dioxide are produced when 25 g of calcium carbonate decomposes at STP? **5.6 L**
$$\text{CaCO}_3 \rightarrow \text{CO}_2 + \text{CaO}$$
14. How many particles of hydrochloric acid are required to produce 5 liters of carbon dioxide at STP?
$$\text{CaCO}_3 + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2$$
15. How many moles of water are produced when 7 liters of oxygen reacts with hydrogen at STP? **0.16 moles**