

<p>Sample problem 1 CH_4 burns in O_2, producing $\text{CO}_2 + \text{H}_2\text{O}(\text{g})$. A 1.22 L CH_4 cylinder, at 15°C, has a pressure of 328 kPa.</p> <ol style="list-style-type: none"> What volume of O_2 at 100kPa and 298K will be required to react completely with all of the CH_4? How many grams of $\text{H}_2\text{O}(\text{g})$ are produced? What volume of CO_2 (at STP) is produced if only 2.15 g of the CH_4 was burned? 	<p>Sample problem 1 CH_4 burns in O_2, producing $\text{CO}_2 + \text{H}_2\text{O}(\text{g})$. A 1.22 L CH_4 cylinder, at 15°C, has a pressure of 328 kPa.</p> <ol style="list-style-type: none"> What volume of O_2 at 100kPa and 298K will be required to react completely with all of the CH_4? How many grams of $\text{H}_2\text{O}(\text{g})$ are produced? What volume of CO_2 (at STP) is produced if only 2.15 g of the CH_4 was burned?
<p>Sample problem 2 Ammonia (NH_3) gas can be synthesized from nitrogen gas + hydrogen gas. What volume of ammonia at 450 kPa and 80°C can be obtained from the complete reaction of 7500 g hydrogen?</p>	<p>Sample problem 2 Ammonia (NH_3) gas can be synthesized from nitrogen gas + hydrogen gas. What volume of ammonia at 450 kPa and 80°C can be obtained from the complete reaction of 7500 g hydrogen?</p>
<p>Sample problem 3 Hydrogen gas (and NaOH) is produced when sodium metal is added to water. What mass of Na is needed to produce 20.0 L of H_2 at STP?</p>	<p>Sample problem 3 Hydrogen gas (and NaOH) is produced when sodium metal is added to water. What mass of Na is needed to produce 20.0 L of H_2 at STP?</p>
<p>Extra Practice</p> <ol style="list-style-type: none"> What volume of oxygen at STP is needed to completely burn 15 g of methanol (CH_3OH) in a fondue burner? ($\text{CO}_2 + \text{H}_2\text{O}$ are products) When sodium chloride is heated to 800°C it can be electrolytically decomposed into Na metal & chlorine (Cl_2) gas. What volume of chlorine gas is produced (at 800°C and 100 kPa) if 105 g of Na is also produced? What mass of propane (C_3H_8) can be burned using 100 L of air at SATP? Note: 1) air is 20% O_2, so 100 L of air holds 20 L O_2, 2) CO_2 and H_2O are the products of this reaction. A 5.0 L tank holds 13 atm of propane (C_3H_8) at 10°C. What volume of O_2 at 10°C & 103 kPa will be required to react with all of the propane? Nitroglycerin explodes according to: $4 \text{C}_3\text{H}_5(\text{NO}_3)_3 \rightarrow 12 \text{CO}_2(\text{g}) + 6 \text{N}_2(\text{g}) + 10 \text{H}_2\text{O}(\text{g}) + \text{O}_2(\text{g})$ <ol style="list-style-type: none"> Calculate the volume, at STP, of each product formed by the reaction of 100 g of $\text{C}_3\text{H}_5(\text{NO}_3)_3$ 200 g of $\text{C}_3\text{H}_5(\text{NO}_3)_3$ is ignited (and completely decomposes) in an otherwise empty 50 L gas cylinder. What will the pressure in the cylinder be if the temperature stabilizes at 220°C? 	<p>Extra Practice</p> <ol style="list-style-type: none"> What volume of oxygen at STP is needed to completely burn 15 g of methanol (CH_3OH) in a fondue burner? ($\text{CO}_2 + \text{H}_2\text{O}$ are products) When sodium chloride is heated to 800°C it can be electrolytically decomposed into Na metal & chlorine (Cl_2) gas. What volume of chlorine gas is produced (at 800°C and 100 kPa) if 105 g of Na is also produced? What mass of propane (C_3H_8) can be burned using 100 L of air at SATP? Note: 1) air is 20% O_2, so 100 L of air holds 20 L O_2, 2) CO_2 and H_2O are the products of this reaction. A 5.0 L tank holds 13 atm of propane (C_3H_8) at 10°C. What volume of O_2 at 10°C & 103 kPa will be required to react with all of the propane? Nitroglycerin explodes according to: $4 \text{C}_3\text{H}_5(\text{NO}_3)_3 \rightarrow 12 \text{CO}_2(\text{g}) + 6 \text{N}_2(\text{g}) + 10 \text{H}_2\text{O}(\text{g}) + \text{O}_2(\text{g})$ <ol style="list-style-type: none"> Calculate the volume, at STP, of each product formed by the reaction of 100 g of $\text{C}_3\text{H}_5(\text{NO}_3)_3$ 200 g of $\text{C}_3\text{H}_5(\text{NO}_3)_3$ is ignited (and completely decomposes) in an otherwise empty 50 L gas cylinder. What will the pressure in the cylinder be if the temperature stabilizes at 220°C?