

Honors Chemistry Chapter 11 Gas Laws Worksheet

1. Analysis of a gaseous chlorofluorocarbon, CCl_xF_y , shows it contains 11.79% C and 69.57% Cl. In another experiment you find that 0.107 grams of the compound fills a 458 mL flask at 25°C with a pressure of 21.3 mm Hg.
 - a. Find the number of moles in the sample. [0.000524 mol]
 - b. Find the molar mass of the chlorofluorocarbon. [204 g/mol]
 - c. (Challenge) Find the molecular formula of the compound. [$\text{C}_2\text{Cl}_4\text{F}_2$]
2. At what temperature will a gas be at if you allow it to expand from an original 456 mL at 65°C to 3.4 L? [2247°C or 2200°C]
3. Hydrogen is collected over water when the atmospheric pressure is 103.0 kPa and the temperature is 21.0°C . When the gas is adjusted to atmospheric pressure the volume is 25.0 mL. What is the volume of the dry gas at STP? [23.0 mL]
4. What is the pressure of a gas if you compressed the gas from its original 500. mL at 698 mmHg to a volume of 302 mL? [1155 mmHg or 1160 mmHg]
5. A propane tank has a pressure of 2326 mm Hg when its temperature is 15.6°C . What is the pressure inside the tank when the temperature is $20.^\circ\text{C}$? [2361 mm Hg or 2400 mm Hg]
6. A child has a toy balloon with a volume of 1.80 liters. The temperature of the balloon when it was filled was 20.0°C and the pressure was 102.3 kPa. If the child were to let go of the balloon and it rose 3 kilometers into the sky where the pressure is 0.667 atm and the temperature is -10.0°C , what would the new volume of the balloon be? [2.4 L]
7. It is not safe to put aerosol canisters in a campfire, because the pressure inside the canister gets very high and they can explode. If I have a 1.0 liter canister that holds 56.0 grams of N_2 gas, and the campfire temperature is 1400°C , what is the pressure, in atm, inside the canister? [274 atm or 270 atm]
8. A 125.0 mL flask is filled with nitrogen as it is collected over water at a pressure of 99.4 kPa and a temperature of 50.0°C . If the gas is heated to 60.0°C , what is the pressure of the dry gas? [89.8 kPa]
9. A bag of potato chips is packaged at sea level (1.00 atm) and has a volume of 315 mL. If this bag of chips is transported to Denver (0.775 atm), what will the new volume of the bag be? [406 mL]
10. Carbon dioxide is produced from the endothermic decomposition of calcium carbonate. The 23.6 mL of gas have a temperature of 73.0°C . When the gas cools to room temperature, 22.0°C , what is the volume of the gas? [20.1 mL]