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| **Ideal Gas Law Worksheet** | |
| **1.** | **Using the information from STP or SATP conditions determine the value of the ideal gas constant.** |
| **2.** | **A sample of 1.00 moles of oxygen at 50oC and 98.6 kPa occupies what volume?** |
| **3.** | **A sample of 4.25 moles of hydrogen at 20.0oC occupies a volume of 25.0 L. Under what pressure is**  **this sample?** |
| **4.** | **If a steel cylinder with a volume of 1.50 L contains 10.0 moles of oxygen, under what pressure is the**  **oxygen if the temperature is 27.0oC?** |
| **5.** | **When the pressure in a certain gas cylinder with a volume of 4.50 L reaches 500 atm, the cylinder is**  **likely to explode.  If this cylinder contains 40.0 moles of argon at 25.0oC, is it on the verge of**  **exploding?  Calculate the pressure in atmospheres.** |
| **6.** | **At 22.0oC and a pressure of 100.6 kPa, a gas was found to have a density of 1.14 g/L. Calculate its molecular mass.** |
| **7.** | **A gas was found to have a density of 1.76 mg/mL at 24.0oC and a pressure of 98.8 kPa. What is its**  **molecular mass?** |
| **8.** | **How many millilitres of nitrogen, N2, would have to be collected at 99.19 kPa and 28oC to have a**  **sample containing 0.015 moles of N2?** |
| **9.** | **The density of a certain gas at 27.0oC and 98.66 kPa is 2.53 g/L. Calculate its molecular mass.** |
| **10.** | **What volume is occupied by 0.25 grams of O2 measured at 25.0oC and 100.66 kPa?** |
| **11.** | **What is the molecular mass of a gas if 2.82 grams of the gas occupies 3.16 litres at STP?** |
| **12.** | **A balloon is to be filled with 30.0 kg of helium gas. What volume can be filled to a pressure of**  **1.15 atm if the temperature is 20.0oC?** |
| **13.** | **In a gas thermometer, the pressure needed to fix the volume of 0.20 g of helium at 0.50 L is**  **113.30 kPa. What is the temperature?** |
| **14.** | **A gaseous compound has the empirical formula CHCl.  At 100oC, its density at 99.97 kPa is**  **3.12 x 10-3 g cm-3. What is the molecular formula of this compound?** |
| **15.** | **The pressure exerted on a diver by the water increases by about 100 kPa for every 10 m of depth.**  **A scuba diver uses air at the rate of 8 L/min at a depth of 10 m where the pressure is 200 kPa**  **(100 kPa due to the atmosphere and 100 kPa due to the water pressure) and the temperature 8oC.**  **If the diver's 10 L air tank is filled to a ressure of 2.1 X 104kPa at a dockside temperature of 32oC,**  **how long can the diver remain safely submerged?** |
| **16.** | **You want to send chlorine gas, Cl2, safely from Vancouver to Kingston.  Chlorine gas is very**  **poisonous and corrosive. You have a 5000 L truck cylinder that will withstand a pressure of 100 atm.**  **The cylinder will be kept at 2oC throughout the trip. How many moles of chlorine gas can you**  **safely ship?** |