

Name:

Period:

Seat#:

Conceptual Questions

<p>1) Write out the Ideal Gas equation. Below the equation list each variable by name and a common unit used for each.</p>	<p>2) What is the value, units, and variable for the gas constant that you must memorize? Do you need to write the units for R when you show your work? Y/N?</p>
<p>3) How can you “rearrange” the Ideal gas law to solve for molar mass? Show the steps!</p>	<p>4) How can you “rearrange” the Ideal gas law to solve for the density of a gas? Show the steps!</p>

Mathematical Questions

- Identify the variables involved
- Show plugging in the variables to the correct places in the equation
- Get an actual answer, including units! Box your answer!
- Don't forget - you must show units and any conversions that might be involved.
- You can either rearrange your equation before you plug in your variables, or after. Do what works for you!

<p>5) Determine the volume of occupied by 2.34 grams of carbon dioxide gas at 1.09atm and 68 °C. <u>1.366L</u></p> <p><u>Variables</u> P = V = n = R = T =</p>
<p>6) A sample of argon gas at STP occupies 56.2 liters. Determine the number of moles of argon and the mass in the sample. <u>2.51 moles, 100.3 g</u></p> <p><u>Variables</u></p>

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7) At what temperature will 0.654 moles of neon gas occupy 12.30 liters at 1.95 atmospheres? 446.7 K

Variables

8) A 30.6 g sample of gas occupies 22.414 L at STP. What is the molar mass of this gas? 30.6 g/mol

Variables

9) 5.600 g of solid CO₂ is put in an empty sealed 4.00 L container at a temperature of 300 K. When all the solid CO₂ becomes gas, what will be the pressure in the container? 0.782 atm

Variables

10) A 40.0 g gas sample occupies 11.2 L at STP. Find the molecular weight of this gas. 80.05 g/mol

Variables

11) If I have 4 moles of a gas at a pressure of 5.6 atm and a volume of 12 liters, what is the temperature in Celsius? 68.4 C

Variables

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12) If I have an unknown quantity of gas at a pressure of 1.2 atm, a volume of 31 liters, and a temperature of 87.0 °C, how many moles of gas do I have? 1.26 mol

Variables

13) It is not safe to put aerosol canisters in a campfire because the pressure inside the canisters can get too high and cause the can to explode. If I have a 1.0L canister that holds 2.0 moles of gas and the campfire temperature is 1400 °C, what is the pressure of the canister? 274.7 atm

Variables

14) How many grams of oxygen are in a 30L scuba tank if the temperature of the can is 300K and the pressure is 200 atm? 7.8 x 10³ g

Variables

15) A shark comes across a diver using the tank from the question above and luckily for the diver, bites down on the canister instead of her. The pressure at 33 ft under water (where our diver was practicing scuba) is 14.7 psi and the temperature of the sea water is 15.5 °C. When the tank explodes what is the new volume of the gas before it rises to the surface? 5.77 x 10³ L

Variables

16) If you have a balloon that can hold 100L of air and you blow it up with 3.0 moles of oxygen at a pressure of 1atm, what is the temperature of the balloon in Kelvin? 406 K

Variables

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17) If I have 17 moles of gas at a temperature of 67 °C, and a volume of 88.89 liters, what is the pressure of the gas?
5.34 atm

Variables

18) Calculate the density of radon at 292 K and 1.10 atm of pressure. 10.2 g/L

Variables

19) The density of a gas is measured at 1.853 g / L at 745.5 mmHg and 23.8 °C. What is its molar mass? 46.03 g/mol

Variables

20) Challenge Problem: 2.035 g H₂ produces a pressure of 1.015 atm in a 5.00 L container at -211.76 °C. What will the temperature (in °C) have to be if an additional 2.099 g H₂ are added to the container and the pressure increases to 3.015 atm. (Hint: Think about how you solved the “basic” gas law problems and what you know about their relationship to the Ideal Gas Equation!) -183.4 C

Variables