

Ch. 10-11 Gas Law Test Review

1. Define a REAL gas.
2. Define an Ideal gas.
3. How do gas particles collide according to the kinetic molecular theory?
4. Summarize all 5 points of the KMT (kinetic molecular theory).
5. What is diffusion of a gas? (Give an example.)
6. What is effusion of a gas? (Give an example.)
7. Why does a can collapse when you drop the pressure? (*Re-watch the Charles's Law Video if you don't know*)
8. What are the values of STP? _____
9. Review the law of conservation of mass! Recall that mass is conserved at all times in an experiment and that the mass of the products must = the total mass of the reactants. Even if one is a gas. In the reaction of $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$ if I have 28 g of nitrogen and 12g of hydrogen, how much NH_3 will I make?
10. Many aerosols or things that can vaporize in a container – often carry warnings to keep away from a flame. How does temperature affect the pressure of a container? (And the volume!)
11. As you get closer to sea level....air pressure increases....how would this affect an object's volume? (What is the relationship between pressure and volume)?
12. Unlike most solids --- gases have the opposite trend in terms of how much can be dissolved into solution! As you heat a solution w/ a gas inside it can hold LESS and LESS gas. IF aquatic life needs dissolved oxygen for respiration....what water temperature would have more? Warm or cool?
13. The same amount of gas in a larger container would have (more/less/or the same) volume?
14. What is pressure and what are the units of pressure?
15. What device measures pressure?
16. What is Boyle's law IN WORDS:

17. What does STP stand for and what are STP conditions?
18. How many Liters are in one mole of a gas at STP?
19. In any equation how can you tell how many MOLES there are of a substance... Ex: $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$
- How many moles of nitrogen? _____ How many of Hydrogen? _____

Problems:

- A. The pressure of a sample of helium is 2.0 atm in a 300-mL container. If the container is compressed to 15 mL without changing the temperature, what is the new pressure? (Boyles)
- B. On a cold winter morning when the temperature is -10°C , the air pressure in an automobile tire is 1.3 atm. If the volume does not change, what is the pressure after the tire has warmed to 15°C ? (Charles)
- C. A gas at 21.0°C has a pressure of 700 mm Hg is measured to take up a volume of 15 mL. What is the calculated volume of the gas at 20.0°C when the new pressure is 740 mm Hg? (Combined)
- D. A mixture of four gases exerts a total pressure of 880 mm Hg. Gases A and B each exert 210 mm Hg. Gas C exerts 110 mm Hg. What pressure is exerted by gas D? (Dalton's)
- E. A 300 mL quantity of ice cream has a mass of 200 grams. The manufacturer bubbles air into the ice cream so that its volume increases by 350 mL. What is the ice cream's approximate final density? (...the MASS didn't change, so density is still mass/ volume – do the mass over your FINAL volume!) – not a gas problem, a density one!
- F. The volume of a gas is 90 mL when the temperature is 81°C . If the temperature is reduced to 0°C without changing the pressure, what is the new volume of the gas? (Charles)
- G. Calculate the approximate volume of a 0.500 mol sample of gas at 20.0°C and a pressure of 1.10 atm. (Ideal)
- H. When hydrogen burns, water vapor is produced. The equation is $2\text{H}_{2(g)} + \text{O}_{2(g)} \rightarrow 2\text{H}_2\text{O}_{(g)}$. If 8.0 L of oxygen are consumed, what volume of water vapor is produced?