Things to Know for Quiz 9

Chem 30A, Fall 2018

Chapter 11

1. Postulates of Kinetic Molecular Theory. What does the kinetic energy depend on? [Ch. 11 #3, 4]
2. Definition of pressure.
3. What is atmospheric pressure? Is it constant?
4. Converting between different units of pressure. (Equivalence statements will be given, for example 1 atm = 760 mmHg) [Ch. 11 #23-32]
5. Why do gases exert pressure?
6. Boyle's Law. $P_1V_1 = P_2V_2$ What happens to volume if pressure goes up? What is the underlying reason?
7. Be able to do problems involving Boyle's law. Solve for the missing variable. (P and V are changing, n and T are not changing.) Be able to explain why your answer makes sense, referring to what the molecules are doing. [Ch. 11 #33-38]
8. What is Charles's Law? What is the equation? Must use T in kelvins.
9. What happens to V if temp goes up? Explain the underlying reason.
10. For problems involving V and T changing (but n and P constant), be able to solve for the missing variable. Be able to explain why your answer makes sense, referring to what the molecules are doing. [Ch. 11 #39-44]
11. What is the combined gas law? Use the combined gas law to solve for the missing variable. (P, V, and T are all changing. Number of moles is constant.) [Ch.11 #51-58]
12. What is Avogadro's law? How does volume relate to moles of gas? Why? (P and T are constant)
13. Be able to use Avogadro's law to solve for V or n if P and T are constant. [Ch. 11 #45-50]
14. What is STP? (What T and P?)
15. If a gas is at STP, any gas has a "molar volume" of 22.4 L/1 mole. This can be used as a conversion factor if the gas is at STP. [Ch. 11 #83-88]
16. Ideal gas law: PV = nRT (Given R.) Be able to solve for any variable. Sometimes you also need to convert units of things before plugging in to the equation. [Ch. 11 #59-68]
17. Finding molar mass of a gas: given grams. Given P, V, and T, use PV = nRT to solve for the number of moles. Then divide the number of grams by the number of moles. The result is the # g/mol, which is the molar mass. [Ch. 11 #69-72]
18. Mixtures of gases: the pressure of each gas added up equals the total pressure. [Ch. 11 #73-78]
19. Pressure of a gas in a mixture = the fraction of molecules of that gas × total pressure. P_A = (fraction A)(P_{total}) [Ch. 11 #79-82]
20. Be able to do stoichiometry problems involving gases. Make sure to balance the equation. You can use PV = nRT to find the number of moles of a gas or to solve for V, P, or any other gas property. Step A: balance equation. Step b: Find moles of whatever you can. Step c: use the mole ratios from the balanced equation to convert to moles of what you want. Step d: convert to the final units. (If the gas is at STP, you can use 22.4 L/1 mole as a conversion factor.) [Ch. 11 #89-98]