**General Final Exam Review – KMT and Gases**

1) If I have 77 moles of a gas at a temperature of 25° and a pressure of 8.0 atm, what is the volume of this gas? R = 0.08206 Latm/molK.

* **Since “moles” is mentioned, you can assume that the ideal gas law (PV = nRT) is being used.**
* **To plug the numbers in, we find that T = 298 K (always convert degrees Celsius to Kelvin by adding 273), pressure is 8.0 atm, moles is 77 moles, R = 0.08206 Latm/mol K.**
* **Put it all together and you get that: (8.0 atm)V = (77 mol)(0.08206 Latm//molK)(298 K)**
* **and V = 235 L**

**Note: It would also be reasonable to ask a question where you had to use this equation using grams of gas instead of moles. Be ready to do the unit conversion!**

2) If I were to compress a sample of oxygen gas from 5 L to 2 L, what would the pressure of the gas be if its initial pressure was 1.0 atm?

**Since moles aren’t used, we use the combined gas law. P1 = 1.0 atm, V1 = 5 L, P2 is unknown, and V2 = 2 L. (Since temperature isn’t mentioned, we can ignore it.)**

**When you solve this, you find that P2 = 2.5 atm.**

3) If I were to perform the process in #2 with nitrogen gas rather than oxygen gas, what would the pressure of the gas be after squishing it?

**It would be the same, 0.4 atm. If we assume these are both ideal gases (and this is a pretty good assumption, as we’ve seen before), we would expect them to behave identically under identical circumstances.**

4) Why do we assume that ideal gas molecules don’t have any volume?

**Because compared to the overall volume of the gas, the molecules themselves count for almost none of the volume.**

5) Is the concept of an ideal gas a good one or a bad one, based on what you know of them? Explain.

**You can say whatever you want for an answer, as long as you can back it up. Personally, I’d answer the question by saying it’s pretty good because real gases behave similarly to ideal gases, but that’s up to you.**

**Other possible topics:**

* **Postulates of KMT**
* **Effusion/diffusion**
* **Anything in any of the PowerPoints.**