**Honors Chemistry – KMT and Gas Laws Review Sheet**

1. What is the main idea behind the kinetic molecular theory? (3 pt)
2. Which of the underlying assumptions about the behavior of gas molecules (I’ve been referring to these as “postulates”) of the KMT do you believe is most accurate? Explain your answer. (4 pt)
3. What is the volume of an ideal gas when the temperature is 0 K? Is this possible? Explain your answer. (4 pt)
4. I’ve got a gas that has a pressure of 4.5 x 10-3 atm. at a temperature of 3500 K. If I were to heat this gas by 250 K, what would the new pressure of this gas be? (4 pt)
5. What real world gas do you believe most closely approximates an ideal gas? Explain your reasons for believing this. (3 pt)
6. For some reason, I have 0.15 moles of an ideal gas in a 57.5 L container at a temperature of 750 K. Given that R = 0.08206 Latm/mol K, what is the pressure inside of this container? (5 pt)
7. Let’s define some terms! (2 pt each)

* ideal gas:
* pressure:
* combined gas law (just write the equation):

**Honors Chemistry – KMT and Gas Laws Review Sheet Answers**

1. What is the main idea behind the kinetic molecular theory? (3 pt)

**You can understand the behavior of gases by understanding how they behave on a molecular level.**

1. Which of the underlying assumptions about the behavior of gas molecules (I’ve been referring to these as “postulates”) of the KMT do you believe is most accurate? Explain your answer. (4 pt)

**Personally, I think that “Gas molecules are in constant, random motion” and “kinetic energy is proportional to temperature in Kelvin” are the best. However, if you say something else and make a compelling case for it, that’s fine, too.**

1. What is the volume of an ideal gas when the temperature is 0 K? Is this possible? Explain your answer. (4 pt)

**Zero. Using PV=nRT, we find that volume goes to zero as temperature goes to zero. This is not possible for a real gas because gas molecules have nonzero volume. Additionally, they tend to condense into liquids and/or solids when they get really cold.**

1. I’ve got a gas that has a pressure of 4.5 x 10-3 atm. at a temperature of 3500 K. If I were to heat this gas by 250 K, what would the new pressure of this gas be? (4 pt)

**4.8 x 10-3 combined gas law, where T2 is 3750 K.3 atm. This is a good one for the**

1. What real world gas do you believe most closely approximates an ideal gas? Explain your reasons for believing this. (3 pt)

**Helium is the best because it’s the smallest gas, it has no intermolecular forces of note (it’s a noble gas, after all), and because it moves the fastest.**

1. For some reason, I have 0.15 moles of an ideal gas in a 57.5 L container at a temperature of 750 K. Given that R = 0.08206 Latm/mol K, what is the pressure inside of this container? (5 pt)

**Plugging into the ideal gas law, you find that P = 0.16 atm.**

1. Let’s define some terms! (2 pt each)

* ideal gas: **A gas that follows all of the postulates of the kinetic molecular theory (i.e. it is infinitely small, etc.)**
* pressure: **A measure of how hard gas molecules push against the sides of a container when they run into it.**
* combined gas law (just write the equation): **I’ll assume you can look this one up. Especially since it was used earlier in the review sheet.**