Gas Laws 2 – Volume & Temperature

Name: _____

***Remember: Temperature has to be measured in Kelvin for the equation to work…

1) A weather balloon with a volume of 4500 L and 298 K at sea level, rises to a height where the temperature is 250 K. What will be the new volume of the balloon?

Check your answer by checking the relationships:

A. How are volume and temperature related? (Directly or indirectly)_____

B. Should the volume go up or down when the temperature goes down? _____

C. Does your answer follow that relationship? _____ (If not, re-check your work).

2) If initially a gas sample occupies a volume of 15.0 mL at temperature of 25 ^{O}C, how would the temperature of the gas sample change if its volume were increased to 25.0 mL?

A. How are volume and temperature related? (Directly or indirectly)_____

B. Should the temperature go up or down when the volume goes up? _____

C. Does your answer follow that relationship? _____

3) If the sample of nitrogen gas has a volume of 4.6 L at a temperature of 300 K, what is the new volume when the temperature is increased to 450 K?

A. How are volume and temperature related? (Directly or indirectly)_____

B. Should the volume go up or down when the temperature goes up? _____

C. Does your answer follow that relationship? _____

4) A balloon with a volume of 2.0 L is filled with a gas at 19 ^{O}C. If the temperature is reduced to 266 K without a change in pressure, what would be the volume of the balloon?

A. Should the volume go up or down? _____

B. Does your answer follow that relationship? _____

5) A balloon contains 72600 mL of He. The temperature is reduced to 150 K and the balloon shrinks to occupy a volume of 25.1 L. What was the initial temperature of the balloon?

A. Should the pressure be more or less? _____

B. Does your answer follow that relationship? _____

Gas Laws 2 – Combined Gas Law

Name: _____

***Remember: Temperature has to be measured in Kelvin for the equation to work…

1) A gas occupies 200 L at 125 K and 0.95 atm. What will be the gas volume at 400 K and 0.75 atm?

2) A He balloon is in a room at 1 atm, 19 ^{O}C and has a volume of 12 L. The balloon is changed to a volume of 17 L as the temperature changes to 30 ^{O}C. What is the new pressure?

3) A sample of chlorine gas has a volume of 22.4 L at STP. If the pressure was changed to 50 ^{O}C and a pressure of 51 kPa, what would be the new volume?

4) A fixed volume container with a gas that measures 3 atmospheres. If the pressure is reduced to 8.2 psi when the temperature goes down to 30 ^{O}C, what was the starting temperature?

5) A sample of methane (CH_4) gas occupies 700. mL at a temperature of -25.0 ^{O}C and a pressure of 3724 mmHg What will be the gas temperature (in ^{O}C) if the volume is increased to 0.850 L and the pressure is raised to 9.50 atm?

Answers: 1) 811 L 3) 52.6 L 5) 311 K