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Chemistry Worksheet Name_____
Amonton's Law and Avogadro's Law + Others Hour_____ Date_____

1. A steel cylinder is left out in the sun all day. At 2:00 P.M., the pressure of the cylinder was 1014 kPa at 33.0 ° C. What was the pressure at 7:00 A.M. when the temp was 21.4 ° C ? Amonton

$\frac{P_1}{T_1} = \frac{P_2}{T_2}$ $\frac{1014\ kPa}{306.15\ K} = \frac{P_2}{294.55\ K}$ $P_2 = 976\ kPa$

$T_1 = 33.0°C + 273.15 = 306.15\ K$

$T_2 = 21.4°C + 273.15 = 294.55\ K$

2. A rigid can of Neon has a pressure of 2.00 atm. at 20.0 ° C. If the can is opened to atmospheric pressure (1.00 atm.), what happens to the temperature of the neon? Amonton

$\frac{P_1}{T_1} = \frac{P_2}{T_2}$ $\frac{2.00\ atm}{293.15\ K} = \frac{1.00\ atm}{T_2}$ $T_2 = 147\ K$ or $-126°C$

$T_1 = 20.0°C + 273.15 = 293.15\ K$

3. A balloon has 38.2 g of H_2 gas at a volume of 428L. What is the volume of the gas if 10.0 g is left out. → 28.2 g → n_2 Avogadro

$\frac{V_1}{n_1} = \frac{V_2}{n_2}$ $\frac{428\ L}{18.9\ mol\ H_2} = \frac{V_2}{14.0\ mol\ H_2}$ $V_2 = 317\ L$

$\frac{38.2\ g\ H_2}{} \left| \frac{1\ mol\ H_2}{2.02\ H_2} \right. = 18.9\ mol\ H_2$

$\frac{28.2\ g\ H_2}{} \left| \frac{1\ mol\ H_2}{2.02\ H_2} \right. = 14.0\ mol\ H_2$

4. How many moles of N_2 gas will you have if 2.00 moles was placed in a 385 mL balloon and the volume was increased to 750.0 mL. Avogadro

$\frac{V_1}{n_1} = \frac{V_2}{n_2}$ $\frac{385\ mL}{2.00\ mol} = \frac{750.0\ mL}{n_2}$ $n_2 = 3.90\ mol$

5. Calculate the pressure of a gas that occupies a volume of 125 mL, if at a pressure of 95.0 kPa, it occupies a volume of 219 mL. Boyle's

$P_1V_1 = P_2V_2$ $\frac{(P_1)(125\ mL)}{125\ mL} = \frac{(95.0\ kPa)(219\ mL)}{125\ mL}$ $P_1 = 166\ kPa$

6. If a gas occupies a volume of 733 mL at 10.0 ° C, at what temperature, in ° C, will it occupy a volume of 1225 mL if the pressure remains constant. Charles'

$\frac{V_1}{T_1} = \frac{V_2}{T_2}$ $\frac{733\ mL}{283.15\ K} = \frac{1225\ mL}{T_2}$ $T_2 = 473\ K$ or $200°C$

$T_1 = 10°C + 273.15 = 283.15\ K$