Pair-Solo-Teacher√ :Gas Laws

2. If 6.12 grams of nitrogen gas is held at a pressure of 5.0 atm and in a container with a volume of 50.0 liters, what is the temperature of the gas? What law did you use to solve? **(SOLO-Teacher√)**

$PV = nRT$; $\frac{PV}{nR} = T$

$6.12\,g\,N_2 \times \frac{1\,mole}{28.02\,g} = 0.218\,mole$

$\frac{5.0\,atm \times 50.0\,L}{0.218\,mole \times 0.0821\,L\cdot atm/mole\cdot K} = 13968\,K$

14000 K

Ideal

4. The gas in a sealed can is at a pressure of 3.00 atm at 25.0°C. A warning on the can tells the user not to store the can in a place where the temperature will exceed 52.0°C. What would the gas pressure in the can be at 52.0°C? What law did you use to solve? **(SOLO-Teacher√)**

$\frac{T_2 P_1}{T_1} = P_2$

$\frac{325K \times 3.00atm}{298K} = 3.27atm$

Lussac Law

6. My car has an internal volume of 2.60 x10^3 liters. If the sun heats my car from a temperature of 20.0^0 C to a temperature of 55.0^0 C, what will the pressure inside my car be? Assume the pressure was initially 760.0 mm Hg. What law did you use to solve? **(SOLO-Teacher√)**

$\frac{T_2 P_1}{T_1} = P_2$

$\frac{328K \times 760.mmHg}{293K} = 851.mmHg$

Lussac law

1.12 atm

8. Divers get "the bends" if they come up too fast because gas in their blood expands, forming bubbles in their blood. If a diver has 0.050L of gas in his blood under a pressure of 250 atm, then rises instantaneously to a depth where his blood has a pressure of 50.0 atm, what will the volume of gas in his blood be? What law did you use to solve? **(SOLO-Teacher√)**

Boyles law

$\frac{P_1 V_1}{P_2} = V_2$

$\frac{0.050L \times 250\,atm}{50.0\,atm} = 0.25\,L$

10. At a constant pressure, a sample of neon gas occupies a volume of 752 mL at 25.0°C. What volume will the gas occupy at standard temperature? What law did you use to solve? **(SOLO-Teacher√)**

Charles law

$T_2 = 273K$

$\frac{T_2 V_1}{T_1} = V_2$

$\frac{273K \times 752mL}{298K} = 689\,mL$