

Combined Gas Law and Dalton's Partial Pressure Problems

Solve the following:

1. A metal tank contains three gases: oxygen, helium, and nitrogen. If the partial pressures of the three gases in the tank are 35 atm of O_2 , 5 atm of N_2 , and 25 atm of He, what is the total pressure inside of the tank?
2. If I initially have a gas at a pressure of 12 atm, a volume of 23 L and a temperature of 200K, and then I raise the pressure to 14 atm and increase the temperature to 300K, what is the new volume of the gas?
3. A gas that has a volume of 28 L, a temperature of $45^\circ C$, and an unknown pressure has its volume increased to 34 L and its temperature decreased to $35^\circ C$. If I measure the pressure after the change to be 2.0 atm, what was the original pressure of the gas?
4. Blast furnaces give off many unpleasant and unhealthy gases. If the total air pressure is 0.99 atm, the partial pressure of carbon dioxide is 0.050 atm, and the partial pressure of hydrogen sulfide is 0.020 atm, what is the partial pressure of the remaining air?
5. If the air from problem 4 contains 22% oxygen, what is the partial pressure of oxygen near a blast furnace?
6. If I have 17 L of gas at a temperature of $67^\circ C$ and a pressure of 88.89 atm, what will be the pressure of the gas if I raise the temperature to $94^\circ C$ and decrease the volume to 12 L?
7. I have an unknown volume of gas at a pressure of 0.50 atm and a temperature of 325 K. if I raise the pressure to 1.2 atm, decrease the temperature to 320 K and measure the final volume to be 48 L, what was the initial volume of the gas?
8. If I have 2.9 L of gas at a pressure of 5.0 atm and a temperature of $50^\circ C$, what will be the temperature of the gas if I decrease the volume of the gas to 2.4 L and decrease the pressure to 3.0 atm?