AP Chemistry – Extra Gas Law Problems

1. A gas has a pressure of 4.62 atm when its volume is 2.33 L. What will be the pressure in torr when the volume is changed to 1.03 L? (7940 torr)

2. A sample of hydrogen at 47°C exerts a pressure of 0.329 atm. The gas is heated to 77°C at constant volume. What will be its new pressure? (0.360 atm)

3. A weather balloon at Earth's surface has a volume of 4.00 L at 31°C and 755 mm Hg. If the balloon is released and the volume reaches 4.08 L at 728 mm Hg, what is the temperature in degrees Celsius? (26°C)

4. How big a volume of dry oxygen gas at STP would you need to take in order to have the same number of oxygen molecules as there are hydrogen molecules in 25.0 L at 0.850 atm and 35°C? (18.8 L)

5. At a deep-sea station 200. M below the surface of the Pacific Ocean, workers live in a highly pressurized environment. How many liters of gas at STP must be compressed on the surface to fill the underwater environment with 2.00×10^7 L of gas at 20.0 atm? (4.00×10^8 L)

6. One method of estimating the temperature of the center of the sun is based on the assumption that the center of the sun consists of gases that have an average molar mass of 2.00 g/mol. If the density of the center of the sun is 1.40 g/cm^3 at a pressure of 1.30×10^9 atm, calculate the temperature in degrees Celsius. (2.26×10^7 °C).

7. The nitrogen in a 30.0 L container at 740 torr and 55°C and the hydrogen in a 20.0 L container at 650 torr and 15°C are pumped into a 25.0 L container at 32°C. What is the final pressure? (1376 torr)