Combined Gas Law Practice Sheet

1) A bag of potato chips is packaged at sea level (1.00 atm) and has a volume of 315 mL. If this bag of chips is transported to Denver (0.775 atm), what will the new volume of the bag be?

2) A Los Angeles class nuclear submarine has an internal volume of eleven million liters at a pressure of 1.250 atm. If a crewman were to open one of the hatches to the outside ocean while it was underwater (pressure = 15.75 atm), what be would the new volume of the air inside the submarine?

3) A child has a toy balloon with a volume of 1.80 liters. The temperature of the balloon when it was filled was 20^0 C and the pressure was 1.00 atm. If the child were to let go of the balloon and it rose 3 kilometers into the sky where the pressure is 0.667 atm and the temperature is -10^0 C, what would the new volume of the balloon be?

4) A commercial airliner has an internal pressure of 1.00 atm and temperature of 25^0 C at takeoff. If the temperature of the airliner drops to 17^0 C during the flight, what is the new cabin pressure?

5) If divers rise too quickly from a deep dive, they get a condition called “the bends” which is caused by the expansion of very small nitrogen bubbles in the blood due to decreased pressure. If the initial volume of the bubbles in a diver’s blood is 15 mL and the initial pressure is 12.75 atm, what is the volume of the bubbles when the diver has surfaced to 1.00 atm pressure?

Combined Gas Law Practice Sheet Answers

1) A bag of potato chips is packaged at sea level (1.00 atm) and has a volume of 315 mL. If this bag of chips is transported to Denver (0.775 atm), what will the new volume of the bag be?
406 mL

2) A Los Angeles class nuclear submarine has an internal volume of eleven million liters at a pressure of 1.250 atm. If a crewman were to open one of the hatches to the outside ocean while it was underwater (pressure = 15.75 atm), what be would the new volume of the air inside the submarine?
873,000 L

3) A child has a toy balloon with a volume of 1.80 liters. The temperature of the balloon when it was filled was 20^0 C and the pressure was 1.00 atm. If the child were to let go of the balloon and it rose 3 kilometers into the sky where the pressure is 0.667 atm and the temperature is -10^0 C, what would the new volume of the balloon be?
2.42 L

4) A commercial airliner has an internal pressure of 1.00 atm and temperature of 25^0 C at takeoff. If the temperature of the airliner drops to 17^0 C during the flight, what is the new cabin pressure?
0.973 atm

5) If divers rise too quickly from a deep dive, they get a condition called “the bends” which is caused by the expansion of very small nitrogen bubbles in the blood due to decreased pressure. If the initial volume of the bubbles in a diver’s blood is 15 mL and the initial pressure is 12.75 atm, what is the volume of the bubbles when the diver has surfaced to 1.00 atm pressure?
191 mL