Gas WS

1 atm = 760 mm Hg

= 760 torr

= 101,325 Pa

= 29.92 in. Hg

= 14.7 psi

R = 0.08206 L atm

Mol K

1. I have added 15 L of air to a balloon at sea level (1.0 atm). If I take the balloon with me to Denver, where the air pressure is 0.85 atm, what will the new volume of the balloon be?

Answer:

2. If I have 45 liters of helium in a balloon at 250 oC and increase the temperature of the balloon to 550 C, what will the new volume of the balloon be?

Answer:

3. Calcium carbonate decomposes at 12000o C to form carbon dioxide and calcium oxide. If 25 liters of carbon dioxide are collected at 12000 oC, what will the volume of this gas be after it cools to 250o C?

Answer:

4. The pressure of a pool float at 30.0 oC is 1.10 atm? What is the temperature if the pressure exerted by the float changes to .49atm and the volume is held constant?

Answer:

V1= V2=

P1 = P2=

T1= T2=

n1 = n2=

5. A tire has a pressure 2.78 atm when the temperature is 23.0 oC, what happens to the pressure when the temperature changes to –15.0 oC and the volume remains constant? Calculate this pressure.

Answer:

V1= V2=

P1 = P2=

T1= T2=

n1 = n2=

6. A toy balloon has an internal pressure of 1.05 atm and a volume of 5.0 L. If the temperature where the balloon is released is 200o C, what will happen to the volume when the balloon rises to an altitude where the pressure is 0.65 atm and the temperature is –150o C?

Answer:

7. A small research submarine with a volume of 120000 L has an internal pressure of 1.0 atm and an internal temperature of 150 C. If the submarine descends to a depth where the pressure is 150 atm and the temperature is 30o C, what will the volume of the gas inside be if the hull of the submarine breaks?

Answer:

8. Suppose we have a sample of ammonia gas with a volume of 3.5 L at a pressure of 1.68 atm. The gas is compressed to a volume of 1.35 L at a constant temperature. Use the ideal gas law to calculate the final pressure.

Answer:

V1= V2=

P1 = P2=

T1= T2=

n1 = n2=

9. A sample of diborane gas (B2H6), a substance that bursts into flame when exposed to air, has a pressure of 345 torr at a temperature of -15ºC and a volume of 3.48 L. If conditions are changed so that the temperature is 36ºC and the pressure is 468 torr, what will be the volume of the sample ?

Answer:

10.A rigid steel cylinder has a volume of 20.0 L. It is filled with N2 gas to a final pressure of 200. atm at 27.0 oC. How many moles of N2 gas does the cylinder contain?

Answer:

11.What pressure will be exerted by 12.6 grams of Nitrogen gas at 25.0oC if the gas is contained in a vessel with a volume of 650. ml?

Answer:

1. If 4.00 moles of a gas at a pressure of 10.8 atm have a volume of 120. L, what is the temperature in Celsius?

Answer:

1. How many liters will 3.75 moles of Helium occupy at STP?

Answer:

1. Container A holds 5.0 L of nitrogen gas. Container B holds 5.0 L of carbon dioxide gas. Which container holds more molecules of gas?

Answer:

16. A container is filled with 4.5 moles of CO2 which occupies a volume of 44.7L. An unknown gas is introduced to the container and the volume changes to 57.8L. What number of moles of the new gas was introduced?

Answer: