

Bio390

Problem: Gas Laws

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You accept a position in a laboratory that is located on ground level on the planet Mars. Ambient pressure at ground level on Mars is approximately one-tenth that of the average barometric pressure at sea level on Earth. Inside the ground-level plastic chamber the pressure is maintained at a level 20 mm Hg higher than the ambient pressure outside, and the temperature inside the chamber is exactly 16°C. An automatic humidifier holds the water vapor tension within the chamber at 10 mm Hg. The artificial chamber atmosphere has the following composition, all on a dry gas basis: (a) oxygen = 70%; (b) carbon dioxide = 3%; and (c) the remaining gases, nitrogen and argon, are maintained at a two to one ratio.

Calculate the percent concentration on a dry gas basis and the partial pressure of each gas in the chamber atmosphere.

<u>Gas</u>	<u>% Composition</u>	<u>Partial Pressure</u>
Oxygen	70	
CO ₂	3	
Nitrogen		
Argon		