

ConcepTest on Ideal Gas Law:

We humans breathe about 12 times a minute. During each breath, approximately 500 mL of air is taken into the lungs and then exhaled. If we assume the volume of air is exactly 500 mL and take room temperature to be 25°C, the atmospheric pressure to be 760 mm Hg, and that 20.9 % of air molecules are oxygen molecules, how many moles of oxygen molecules are inhaled in each breath? The gas constant, R, is 0.0821 atm·L/mol·K

1. 4.26×10^{-3} mol
2. 2.04×10^{-2} mol
3. 5.08×10^{-2} mol
4. 3.24 mol

Correct Answer: 1. 4.26×10^{-3} mol

Comment to Instructor: A calculator is needed for this. You may also want to write the Ideal Gas Equation on the blackboard. Choice 2 indicates they neglected to take into account that only 20.9% of the air is oxygen. Choice 3 indicates they forgot to convert T into kelvin units. Choice 4 indicates they forgot to convert the pressure from mm Hg to atm.
