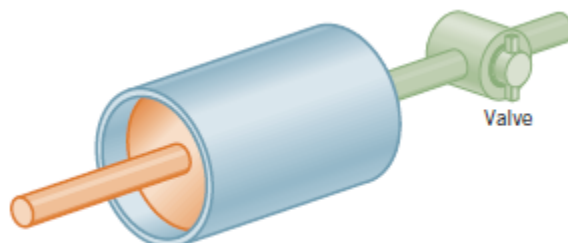


## Thermodynamics Ideal Gas Law Conceptual Problems

Conceptual Problems from Cutnell and Johnson 9<sup>th</sup> Edition Ch 14

*Thermodynamics.Ideal-Gas.CP.PUB.1:* For an ideal gas, each of the following unquestionably leads to an increase in the pressure of the gas, except one. Which one is it? **(a)** Increasing the temperature and decreasing the volume, while keeping the number of moles of the gas constant **(b)** Increasing the temperature, the volume, and the number of moles of the gas **(c)** Increasing the temperature, while keeping the volume and the number of moles of the gas constant **(d)** Increasing the number of moles of the gas, while keeping the temperature and the volume constant **(e)** Decreasing the volume, while keeping the temperature and the number of moles of the gas constant.

*Thermodynamics.Ideal-Gas.CP.PUB.2:* The cylinder in the drawing contains 3.00 mol of an ideal gas. By moving the piston, the volume of the gas is reduced to one-fourth its initial value, while the temperature is held constant. How many moles  $\Delta n$  of the gas must be allowed to escape through the valve, so that the pressure of the gas does not change?



*Thermodynamics.Ideal-Gas.CP.PUB.3:* Carbon monoxide is a gas at 0°C and a pressure of  $1.01 \times 10^5$  Pa. It is a diatomic gas, each of its molecules consisting of one carbon atom (atomic mass = 12.0 u) and one oxygen atom (atomic mass = 16.0 u). Assuming that carbon monoxide is an ideal gas, calculate its density  $\rho$ .

Conceptual Problems from Knight 3<sup>rd</sup> Edition Ch

*Thermodynamics.Ideal-Gas.CP.PUB.4:* A gas cylinder contains 1.0 mol of helium at a temperature of 20°C. A second identical cylinder contains 1.0 mol of neon at 20°C. The helium atoms are moving with a larger average speed, but the gas pressure in the two containers is the same. Explain how this is possible.

*Thermodynamics.Ideal-Gas.CP.PUB.5:* A gas is in a sealed container. By what factor does the gas pressure change if

- a) The volume is doubled, and temperature is tripled?
- b) The volume is halved, and the temperature is tripled?

*Thermodynamics.Ideal-Gas.CP.PUB.6:* A gas is in a sealed container. By what factor does the gas temperature change if

- a) The volume is doubled, and the pressure is tripled?
- b) The volume is halved, and the pressure is tripled?