Answer on Question #65574-Molecular Physics-Thermodynamics

State the relevant laws which are applicable on the following observation of gas.

(1) A balloon shrinks when kept in a cold place.

(2) Pressure of moist gas is higher than that of dry gas.

Solution

(1) The pressure P inside a balloon is given by (equation of state of ideal gas)

$$P = nkT.$$

When temperature decreases, the pressure does too. So the outside atmospheric pressure will shrink the balloon.

(2) The pressure P in terms of molar mass M equation (equation of state of ideal gas)

$$PV = \frac{m}{M}RT.$$

$$P = \frac{m}{MV}RT.$$

Since

$$M_{\text{moist gas}} < M_{\text{dry gas}},$$

so

$$P_{\text{moist gas}} > P_{\text{dry gas}}.$$