Answer on Question #82573, Chemistry / General Chemistry

Before the tanker was cleaned, it was full of air gas particles. The tanker has a volume of 114,000 L. If the internal pressure was 1.00 atm and the temperature was 21 C, how many moles of air gas are inside?

Solution

Ideal gas law states:

PV = vRT, where v is the number of moles;

Find v:

$$v = \frac{PV}{RT},$$

where P = 101300 Pa;

V = 114 m^3;

T = 294 K;

R = 8.314 m^3×Pa×K^{-1}×mol^{-1}

$$v = \frac{101300 \times 114}{294 \times 8.314} = \textbf{4724.5 (mol)}$$

Answer

4724.5 mol of air gas are inside the tanker.