P # D

Ch 10 Worksheet

$V = 1.0 \times 10^{-6}\ m^3$

$T = 20\ ^\circ C = 293\ K$

$P = 1\ atm = 1.0 \times 10^5\ Pa$

a) $P \cdot V = n \cdot R \cdot T$

$(1.0 \times 10^5\ Pa)(1.0 \times 10^{-6}\ m^3) = n \cdot (8.31\ J/mol \cdot K)(293\ K)$

$n = 4.1 \times 10^{-5}\ mol \cdot \frac{6.02 \times 10^{23}\ molecules}{1\ mol}$

$\boxed{N = 2.5 \times 10^{19}\ molecules}$

b) $V = 1.0 \times 10^{-6}\ m^3$
$P = 1.0 \times 10^{-11}\ Pa$
$T = 293\ K$

$P \cdot V = n \cdot R \cdot T$

$(1.0 \times 10^{-11}\ Pa)(1.0 \times 10^{-6}\ m^3) = n\ (8.31\ J/mol \cdot K)(293\ K)$

$\boxed{n = 4.1 \times 10^{-21}\ mol}$