P #C

$T = 20\,°C = 293\ K$

$V = .0080\ m^3$

$P = 9.0\ atm \cdot \dfrac{1.0 \times 10^5\ Pa}{1\ atm} = 9.0 \times 10^5\ Pa$

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

$(9.0 \times 10^5\ Pa)(.0080\ m^3) = n \cdot (8.31\ J/mol \cdot K) \cdot (293\ K)$

$$\boxed{n = 3.0\ mol}$$

b) $3.0\ mol \cdot \dfrac{6.02 \times 10^{23}\ molecules}{1\ mole}$

$$\boxed{N = 1.8 \times 10^{24}\ molecules}$$