

If the vapor pressure of methanol (CH<sub>3</sub>OH) at 25 °C is 126 mmHg, calculate the value of K<sub>p</sub>

Solution:

$$\ln \frac{p}{p^\circ} = -\frac{\Delta G^\circ}{RT};$$

$$\Delta G^\circ = 4455 \text{ J/mol};$$

$$K^\circ = \exp \left[ \ln \frac{p}{p^\circ} \right] = 0.1658;$$

$$K_p = K^\circ (p^\circ)^{\Delta v}; \Delta v = 0;$$

$$K_p = 0.1658 \text{ atm}.$$

Answer:

$$K_p = 0.1658 \text{ atm}.$$