Q Solve

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SOLVED PROBLEM 2. The value of K_p at 25°C for the reaction

$$2NO(g) + Cl_2(g) \rightleftharpoons 2NOCl(g)$$

is 1.9×10^3 atm^{-1}. Calculate the value of K_c at the same temperature.

SOLUTION

We can write the general expression as

$$K_p = K_c (RT)^{\Delta n} \text{ or } K_c = \frac{K_p}{(RT)^{\Delta n}}$$

Here,

$$T = 25 + 273 = 298\ \text{K}$$
$$R = 0.0821$$
$$\Delta n = 2 - (2 + 1) = -1$$
$$K_p = 1.9 \times 10^3$$

Substituting these values in the general expression

$$K_c = \frac{1.9 \times 10^3}{(0.0821 \times 298)^{-1}}$$
$$= \mathbf{4.6 \times 10^4}$$