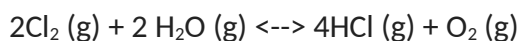


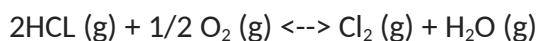
Answer on Question #62740 - Chemistry - Other

Task:

The K_{eq} for the equilibrium below is 7.52×10^{-2} at 480.0 C.



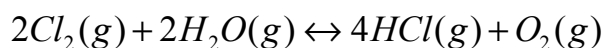
What is the value of K_{eq} at this temperature for the following reaction?



- A) 5.66×10^{-3}
- B) 13.3
- C) -0.0376
- D) 0.274
- E) 3.65

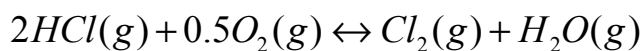
Solution:

The reaction (1):



$$K_1 = \frac{P_{O_2}^1 \times P_{HCl}^4}{P_{Cl_2}^2 \times P_{H_2O}^2};$$

The reaction (2):



$$K_2 = \frac{P_{Cl_2} \times P_{H_2O}}{P_{O_2}^{0.5} \times P_{HCl}^2};$$

$$K_2 = (\sqrt{K_1})^{-1} = \frac{1}{\sqrt{K_1}};$$

$$K_2 = \frac{1}{\sqrt{K_1}} = \frac{1}{\sqrt{7.52 \times 10^{-2}}} = \frac{1}{0.274223} = 3.6466;$$

$$K_2 = 3.6466 \approx 3.65;$$

Answer: E) 3.65