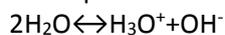


at 60 degrees celcius, the value of K_w is 1.0×10^{-13} exponent. calculate the concentrations of hydronium ions and hydroxide ions in water at this temperature.

Solution:

The equilibrium self-ionization of water is shown below:



The product of hydronium and hydroxide ions concentration is the ion product of water:

$$K_w = [\text{H}_3\text{O}^+] \cdot [\text{OH}^-]$$

So, the concentrations of $[\text{H}_3\text{O}^+]$ and $[\text{OH}^-]$ calculate for the equation:

$$[\text{H}_3\text{O}^+] = [\text{OH}^-] = \sqrt{K_w} = \sqrt{10 \cdot 10^{-13}} = 3.16 \cdot 10^{-7} \text{ mol/L}$$

Answer: $[\text{H}_3\text{O}^+] = [\text{OH}^-] = 3.16 \cdot 10^{-7} \text{ mol/L}$.