

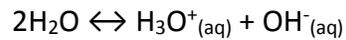
Answer on Question #42131 - Chemistry - Inorganic Chemistry

Question

In a solution at 25°C, the $[H^+]$ is 3.5×10^{-6} M. What is the $[OH^-]$?

Answer:

Water itself is a weak acid and a weak base. It dissociates according to the equilibrium:



with a dissociation constant, K_w defined as

$$K_w = [H^+][OH^-],$$

where $[H^+]$ stands for the concentration of the aquated hydronium ion and $[OH^-]$ represents the concentration of the hydroxide ion. K_w has a value of about 10^{-14} at 25 °C.

Therefore the concentration of hydroxide ions in the solution equals:

$$[OH^-] = \frac{K_w}{[H^+]} = \frac{10^{-14}}{3.5 \times 10^{-6}} = 2.86 \times 10^{-9} \text{ M}$$

Answer: $[OH^-] = 2.86 \times 10^{-9}$ M.