

Answer on question #56444 - Chemistry - General Chemistry

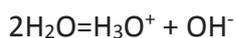
Question:

#1. Calculate the $[H_3O^+]$ of neutral aqueous solution. Express your answer using two significant figures.

#2. Calculate the $[OH^-]$ of neutral aqueous solution. Express your answer using two significant figures.

Solution:

#1. The equation of autoprotolysis of water:



The constant of autoprotolysis:

$$K_w = [H_3O^+][OH^-] = 10^{-14}$$

In neutral aqueous solution $[H_3O^+] = [OH^-]$

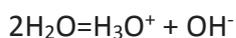
$$\text{So, } [H_3O^+] = \sqrt{10^{-14}} = 10^{-7} \text{ M}$$

Answer:

$$[H_3O^+] = 10^{-7} \text{ M}$$

Solution:

#2. The equation of autoprotolysis of water:



The constant of autoprotolysis:

$$K_w = [H_3O^+][OH^-] = 10^{-14}$$

In neutral aqueous solution $[H_3O^+] = [OH^-]$

$$\text{So, } [OH^-] = \sqrt{10^{-14}} = 10^{-7} \text{ M}$$

Answer:

$$[OH^-] = 10^{-7} \text{ M}$$