Answer on Question #59397, Chemistry / General Chemistry

1. A solution is tested with a pH of 3.95 is recorded. Calculate the $[H_3O^+]$ and the $[OH^-]$ for this solution.

Solution:

$pH = -log[H^+]$

$[H^+] = [H_3O^+] = 10^{-pH}$

$[H^+] = [H_3O^+] = 10^{-3.95} = 1.12 \times 10^{-4}$

From the ionic product of water:

$[H^+] \times [OH^-] = 10^{-14}$

$[OH^-] = \dfrac{10^{-14}}{[H^+]}$

$[OH^-] = \dfrac{1 \times 10^{-14}}{1.12 \times 10^{-4}} = 8.9 \times 10^{-11}$

Answer: $[H_3O^+] = 1.12 \times 10^{-4}$, $[OH^-] = 8.9 \times 10^{-11}$.