Answer on the Question #64532, Chemistry / General chemistry

Show the calculation of the [OH^-] of a solution whose pH=10.34

Solution:

To calculate the $[OH^-]$, we can use the common knowledge about pK_w:

$$pK_w = pH + pOH = 14$$

From this equation pOH is the difference between pK_w and pH:

$$pOH = pK_w - pH = 14 - 10.34 = 3.66$$

As we know, pOH is the negative logarithm of [OH-]:

$$pOH = -\lg[OH^-]$$

So, solution whose pOH is 3.66 have concentration of $[OH^-]$ equal to:

$$[OH^-] = 10^{-pOH} = 10^{-3.66} = 2.2 \cdot 10^{-4} M$$

Answer: $\boldsymbol{[OH^-] = 2.2 \cdot 10^{-4} M}$