

Answer on Question#38272-Chemistry- Inorganic Chemistry

Question

Calculate the hydrogen ion concentration and pH value of a solution in which the hydroxide ion concentration is $1 \cdot 10^{-9}$ mol/l

Solution

Ion product of water is constant value

$$[H^+][OH^-] = 1 \cdot 10^{-14}$$

Whence

$$[H^+] = \frac{1 \cdot 10^{-14}}{[OH^-]} = \frac{1 \cdot 10^{-14}}{1 \cdot 10^{-9}} = 1 \cdot 10^{-5}$$

pH value equals to

$$pH = -\lg[H^+] = -\lg(1 \cdot 10^{-5}) = 5$$

Answer: $[H^+] = 1 \cdot 10^{-5}$; $pH = 5$