

Answer on Question#41125-Chemistry-Physical chemistry

Question.

Ionic product of water is 4×10^{-13} at a particular temperature ($t^{\circ}\text{C}$). The neutral point based on a pH scale at t° is

Solution.

Ionic product of water is:

$$K_W = [H_3O^+][OH^-]$$

Neutral point condition:

$$[H_3O^+] = [OH^-]$$

$$K_W = [OH^-]^2$$

$$4 \times 10^{-13} = [OH^-]^2$$

$$[H_3O^+] = [OH^-] = 0.63 \times 10^{-6}$$

$$pH = -\log([H_3O^+]) = 6.2$$

Answer: Neutral point pH = 6.2