

Answer to the Question #47302 - Chemistry – Other

Question

A 878 mL aqueous solution contains 0.0314 mol of HCl. What is the pH? Give your answer to 3 significant figures.

Answer:

Molar concentration of this solution is:

$$C = \frac{n}{V} = \frac{0.0314}{0.878} = 0.036 \text{ mol/L}$$

n – Number of moles of HCl, n = 0.0314 mol.

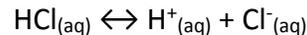
V – Volume of the solution, V = 878 mL = 0.878 L.

pH equals:

$$\text{pH} = -\lg [\text{H}^+]$$

[H⁺] – Molar concentration of H⁺ ions.

Hydrochloric acid is a strong acid and it fully dissociates in water:



We see that the concentration of H⁺ ions is equal to the concentration of HCl. Therefore H⁺ ion concentration is:

$$[\text{H}^+] = C(\text{HCl}) = 0.036 \text{ mol/L}$$

So, pH value of 0.036 M HCl is:

$$\text{pH} = -\lg (0.036) = 1.444$$

Answer: pH = 1.444