Answer on Question #43447 - Chemistry – Inorganic Chemistry

Question:

What is the pH of a 0.025M solution of hydrochloric acid?

1. 16.0

2. 3.68
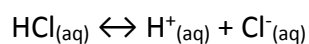
3. 0.16

4. 1.60

5. 0.025

How do I work this out?

Answer:

1. pH equals:

$$pH = -lg [H^+]$$

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

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

$$HCl_{(aq)} \longleftrightarrow H^+_{(aq)} + Cl^-_{(aq)}$$

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

$$[H^+] = C(HCl) = 0.025 \ M = 0.025 \ mol/L$$

So, pH value of 0.025 M HCl is:

$$pH = -lg (0.025) = 1.60$$

Answer: (4): pH = 1.60