
Question 21 (3 marks)

A 0.001 mol L^{-1} solution of hydrochloric acid and a 0.056 mol L^{-1} solution of ethanoic acid both have a pH of 3.0.

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Why do both solutions have the same pH?

They have the same pH because their $[\text{H}^+]$ is the same. Hydrochloric acid is strong therefore, even though its concentration is lower than the ethanoic acid, it has the same $[\text{H}^+]$ as the weak ethanoic acid here, as the HCl ionises completely.