
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?

Although HCl is a stronger acid than ethanoic acid, and has a higher rate of dissociation, the ethanoic acid solution has a much higher concentration, meaning there are more H^+ ions in solution, giving it a similar pH to the HCl acid, despite its lower dissociation rate.