
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?

The pH of the solution depends on the concentration of the acid. Here hydrochloric acid (HCl) has the concentration of 0.001 mol L^{-1} which is less than that of the concentration of the ethanoic acid (i.e. 0.056 mol L^{-1}). Therefore a low concentration HCl has the same pH of 3.0 as a high concentration CH_3COOH .