

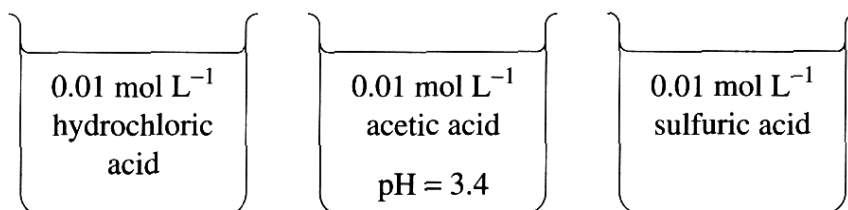
Chemistry

Section I – Part B (continued)

Marks

Question 22 (5 marks)

Solutions of hydrochloric acid, acetic acid and sulfuric acid were prepared. Each of the solutions had the same concentration (0.01 mol L^{-1}). The pH of the acetic acid solution was 3.4.



- (a) Calculate the pH of the hydrochloric acid solution. 1

$$\text{pH} = -\log [\text{H}^+] = -\log 0.01 = 2$$

- (b) Compare the pH of the sulfuric acid solution to the pH of the hydrochloric acid solution. Justify your answer. (No calculations are necessary.) 2

The pH of the sulfuric acid solution should be equal to the pH of the hydrochloric acid solution because in each case we are finding the $-\log [\text{H}^+]$. Since the ~~concentration~~ number of moles of H^+ is the same, then the pH should be the same.

- (c) Explain why the acetic acid solution has a higher pH than the hydrochloric acid solution. 2

CH3COOH

Acetic acid is a weaker acid than the hydrochloric acid, therefore it will have a higher pH. Instead of finding the H^+ concentration we are finding the OH^- concentration because that is the function group of the acetic acid.