

Acid-Base #2

(K_a Calculations: Type 1)

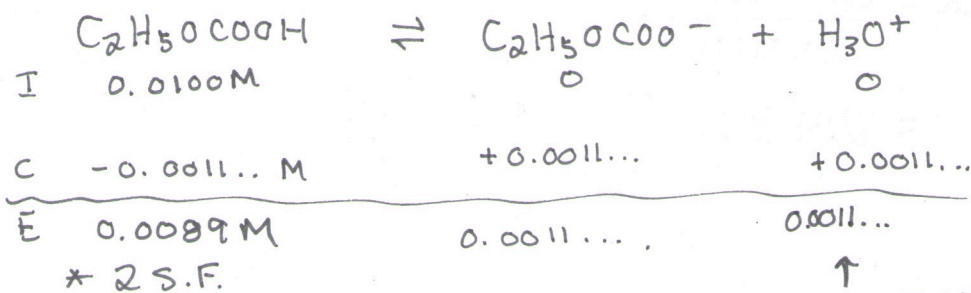
Write your response in the space provided. Express your response with correct sig figs & units where appropriate.

1. Lactic acid, C₂H₅OCOOH, is a weak acid produced by the body. At 25°C, 0.0100 M C₂H₅OCOOH has a pH of 2.95. Calculate the value of K_a for lactic acid.

(4 marks)



$$K_a = \frac{[\text{C}_2\text{H}_5\text{OCOO}^-][\text{H}_3\text{O}^+]}{[\text{C}_2\text{H}_5\text{OCOOH}]} = ?$$



↑
pH = 2.95

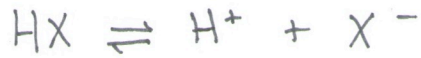
$$[\text{H}_3\text{O}^+] = 10^{-2.95}$$

$$K_a = \frac{(0.0011... \text{ M})(0.0011... \text{ M})}{0.0089}$$

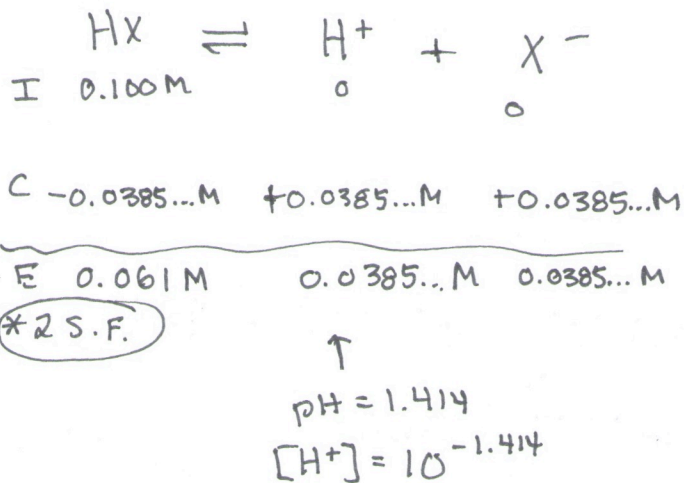
$$K_a = 1.4 \times 10^{-4}$$

2. A 0.100M solution of an unknown weak acid, HX, has a pH = 1.414.
 What is the K_a for HX?

(4 marks)



$$K_a = \frac{[\text{H}^+][\text{X}^-]}{[\text{HX}]} = ?$$



$$K_a = \frac{(0.0385...M)^2}{(0.061M)}$$

$$K_a = 2.4 \times 10^{-2} \quad * 2 \text{ S.F.}$$