Name	AP Chem	//
Chapter 14 HW - #3 (Due 11		
clearly label all final answer	e questions. One will be graded. Show a	all work. Box and
1. A pure 16.85 g sample of the weat 500. mL of solution.	ak base ethylamine, C ₂ H ₅ NH ₂ , is dissolved in enou	igh distilled water to make
(a) Calculate the molar concentration	n of the $C_2H_5NH_2$ in the solution. water according to the equation below.	
• •	water according to the equation below. $\stackrel{\triangleright}{=} C_2H_5NH_3^+(aq) + OH^-(aq)$	
	expression for the reaction between $C_2H_5NH_2(aq)$ a (aq) , which is present in the solution at the higher	
(d) A different solution is made by r Assume that volumes are additive. T	mixing 500. mL of $0.500 M C_2H_5NH_2$ with 500. ml The pH of the resulting solution is found to be 10.9	
	ion of $OH^{-}(aq)$ in the solution. ation that represents the reaction that occurs when	the C ₂ H _e NH ₂ solution is
mixed with the HCl solutio	n.	
(iii) Calculate the molar co (iv) Calculate the value of A	ncentration of the $C_2H_5NH_3^+(aq)$ that is formed in K_b for $C_2H_5NH_2$.	the reaction.
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2. $HC_3H_5O_2(aq) \rightleftharpoons C_3H_5O_2^-(aq) + H^+(aq) K_a = 1.34 \times 10^{-5}$
Propanoic acid, HC ₃ H ₅ O ₂ , ionizes in water according to the equation above. (a) Write the equilibrium-constant expression for the reaction.
(b) Calculate the pH of a 0.365 M solution of propanoic acid.
(c) A 0.496 g sample of sodium propanoate, $NaC_3H_5O_2$, is added to a 50.0 mL sample of a 0.365 M solution of
propanoic acid. Assuming that no change in the volume of the solution occurs, calculate each of the following. (i) The generative of the propagate ion C H $O_{-}^{-}(ac)$ in the solution
(i) The concentration of the propanoate ion, $C_3H_5O_2^-(aq)$, in the solution (ii) The concentration of the $H^+(aq)$ ion in the solution
The methanoate ion, $HCO_2^-(aq)$, reacts with water to form methanoic acid and hydroxide ion, as shown in the
following equation.
$\text{HCO}_2^-(aq) + \text{H}_2\text{O}(l) \Longrightarrow \text{HCO}_2\text{H}(aq) + \text{OH}^-(aq)$ (d) Given that $[\text{OH}^-]$ is $4.18 \times 10^{-6} M$ in a 0.309 M solution of sodium methanoate, calculate each of the following.
(i) The value of K_b for the methanoate ion, $HCO_2^-(aq)$
(ii) The value of K_a for methanoic acid, HCO_2H
(e) Which acid is stronger, propanoic acid or methanoic acid? Justify your answer.