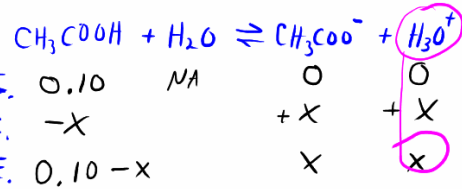


Calculate the pH of 0.10 M  $\text{CH}_3\text{COOH}$  solution?

1. chemistry

a) A or B?

$$K_a = \frac{[\text{CH}_3\text{COO}^-][\text{H}_3\text{O}^+]}{[\text{CH}_3\text{COOH}]}$$



② I.C.E

③ Look up  $K_a$  value  $1.8 \times 10^{-5}$

$$1.8 \times 10^{-5} = \frac{x^2}{0.10 - x}$$

$$x = 0.00133 = [\text{H}_3\text{O}^+]$$

Try dropping if  $x < 5\%$  0.10

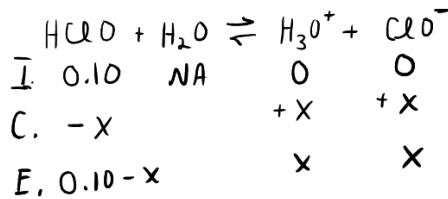
$$\text{pH} = -\log 0.00133$$

$$\text{pH} = 2.88$$

$\text{HClO}$   $K_a = 3.5 \times 10^{-8}$ , Find pH of 0.10 M solution.

① chemistry

$$K_a = \frac{[\text{H}_3\text{O}^+][\text{ClO}^-]}{[\text{HClO}]}$$



$$3.5 \times 10^{-8} = \frac{[x][x]}{[0.10 - x]}$$

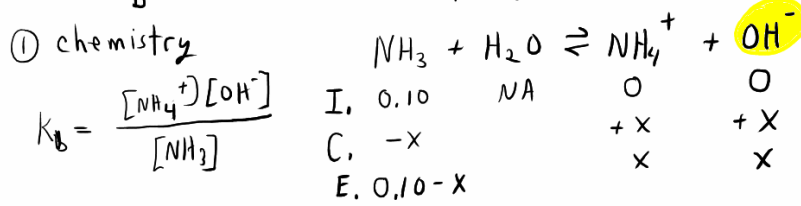
try dropping if  $x < 5\%$  of 0.10  
dropping is justified.

$$[\text{H}_3\text{O}^+] = x = 5.92 \times 10^{-5}$$

$$\text{pH} = -\log x = 4.23 \text{ 2 sig figs}$$

$$\frac{0.10}{x 0.05}$$

$\text{NH}_3$   $K_b = 1.8 \times 10^{-5}$ . Find pH of 0.10 M solution



$$1.8 \times 10^{-5} = \frac{x^2}{0.10 - x}$$

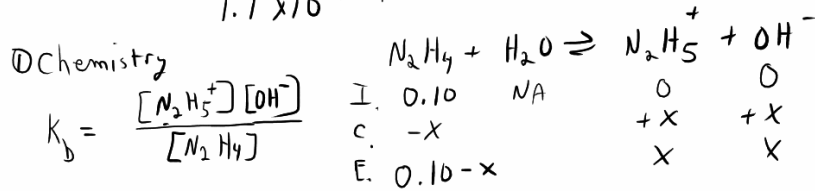
try dropping

$$x = [\text{OH}^-] = 1.34 \times 10^{-3} \quad \text{pOH} = 2.87$$

2 sig fig

$$\text{pH} = 11.13 \quad [\text{H}_3\text{O}^+] = 7.4 \times 10^{-12} = 10^{-\text{pH}}$$

$\text{N}_2\text{H}_4$   $K_b = \frac{6.5 \times 10^{-5}}{1.7 \times 10^{-6}}$  pH of 0.10 M solution.



$$1.7 \times 10^{-6} = \frac{x^2}{0.10 - x}$$

Drop??

$$x = [\text{OH}^-] = 4.12 \times 10^{-4}$$

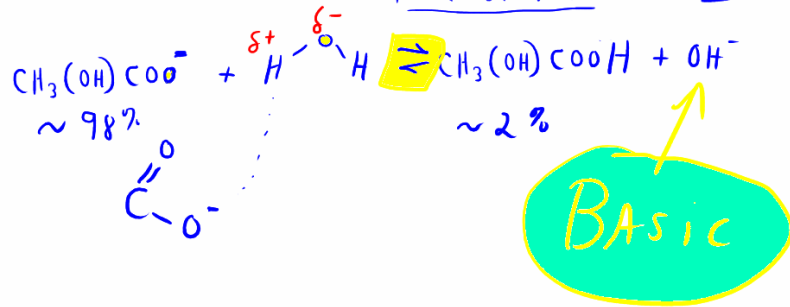
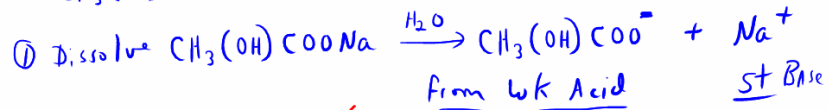
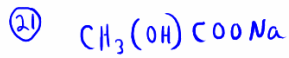
$$\text{pOH} = 3.39 \dots$$

2 sig fig

$$[\text{H}_3\text{O}^+] = \frac{10^{-14}}{4.12 \times 10^{-4}} = 2.45 \times 10^{-11}$$

$$\text{pH} = 10.61 \quad [\text{H}_3\text{O}^+] = 10^{-10.61}$$

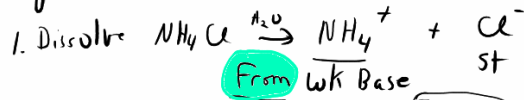
$$[\text{OH}^-] = 10^{-3.39}$$



$\text{NH}_4\text{Cl}$   
SALT

pH of 0.10 M solution?

Chemistry (2 steps)

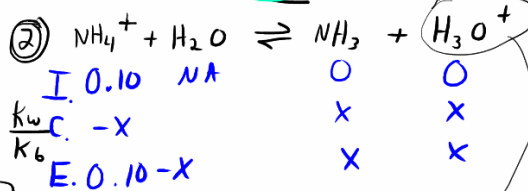


$K_b \text{NH}_3 = 1.8 \times 10^{-5}$

$K_a K_b = 10^{-14}$

$K_a = 5.56 \times 10^{-10} = \frac{K_w}{K_b}$

$K_a = \frac{[\text{NH}_3^+][\text{H}_3\text{O}^+]}{[\text{NH}_4^+]}$



$5.56 \times 10^{-10} = \frac{x^2}{0.10 - x}$  Try Drop

$x = [\text{H}_3\text{O}^+] = 7.46 \times 10^{-6}$  pH = 5.13