

81. (b)  $10^{-7} \text{ NHCl}$  means  $(H^+) = 10^{-7} \text{ M}$

$$pH = -\log(H^+), pH = 7$$

82. (c)  $pH = 2 ; pH = -\log [H^+] ; 2 = -\log [H^+]$

$$[H^+] = 10^{-2} = 0.01 \text{ N}$$

83. (b)  $pH$  does not change on addition of some concentration of  $\text{HCl}$ .

84. (b) Solution of  $\text{CH}_3\text{COONa}$  on addition to acid shows a decrease in dissociation of acid

due to common ion effect. To decrease in  $[H^+]$  or increase  $pH$ .

85. (c)  $pH + pOH = 14; pH = 14 - pOH; pH = 14 - 6 = 8$ .

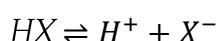
86. (b)  $[H^+]_I = 10^{-5} [H^+]_{II} = 10^{-2}$

$$\text{Thus increase in } [H^+] = \frac{10^{-2}}{10^{-5}} = 1000 \text{ times}$$

87. (a) The  $\text{HCl}$  is a strong acid and they lose easily  $H^+$  in solution.

88. (a)  $X^- + H_2O \rightleftharpoons OH^- + HX$

$$K_b = \frac{[OH^-][HX]}{[X^-]}$$



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

$$\therefore K_a \times K_b = [H^+][OH^-] = K_w = 10^{-14}$$

$$\text{Hence } K_a = 10^{-4}$$

Now as  $[X^-] = [HX]$ ,  $pH = pK_a = 4$ .

90. (d) Buffer solution is formed. So the  $pH$  will not change.



91. (b)  $Na_2CO_3$  when react with water form strong base and weak acid. So its aqueous

solution is basic.

92. (c)  $K_w = [H_3O^+][OH^-]$

Concentration of  $H_3O^+$  in distilled water =  $1 \times 10^{-6} mol/l$ .

Now  $[H_3O^+] = [OH^-]$

$$K_w = [1 \times 10^{-6}] \times [1 \times 10^{-6}] = 1 \times 10^{-12}$$

93. (a)  $[OH^-] = 10^{-1} M; pOH = 1$

$$pH + pOH = 14; pH = 14 - 1 = 13$$

94. (a) Maximum  $pH HClO$  is a weak acid all of these. So that the salt of weak acid is also weak.

95. (c) As the solution is acidic  $pH < 7$ . This is because  $[H^+]$  from  $H_2O[10^{-7}]$  cannot be neglected in comparison to  $10^{-12} M$ .

96. (b) [Normal salt + acidic salt] is a buffer solution.

97. (b)  $100 ml$  of  $\frac{M}{10} NaOH = 50 ml$  of  $\frac{M}{5} NaOH$ . They exactly neutralise  $50 ml \frac{N}{5} HCl$ . Hence

$pH$  of resulting solution = 7.

98. (b)  $M_1 = 6.0 M$  of  $HCl; V_1 = ?$

$M_2 = 0.30 M$  is  $H^+$  concentration in solution.



$V_2 = 150 \text{ ml}$  of solution.

$$M_1 V_1 = M_2 V_2; 6.0 \times V_1 = .30 \times 150$$

$$V_1 = \frac{.30 \times 150}{6} = 7.5 \text{ ml.}$$

99. (b)  $pH = 3$ ,  $[H^+] = 10^{-3} M$

$$\therefore [H^+] = \sqrt{K \times c}$$

$$[10^{-3}]^2 = K \times c ; \frac{[10^{-6}]}{0.1} = K = 10^{-5}$$

100. (b) When ratio of concentration of acid to salt is increased  $pH$  decrease.

