

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

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

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

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

83. (b) pH does not change on addition of some concentration of HCl .

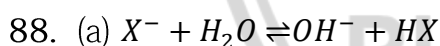
84. (b) Solution of CH_3COONa on addition to acid shows a decrease in dissociation of acid due to common ion effect. To decrease in $[\text{H}^+]$ or increase pH .

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

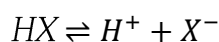
86. (b) $[\text{H}^+]_{\text{I}} = 10^{-5}$ $[\text{H}^+]_{\text{II}} = 10^{-2}$

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

87. (a) The HCl is a strong acid and they lose easily H^+ in solution.



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



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

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

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

$$\text{Now as } [\text{X}^-] = [\text{HX}], pH = pK_a = 4.$$

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 = $1 \times 10^{-6} \text{ mol/l}$.

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

$$M_1V_1 = M_2V_2; 6.0 \times V_1 = .30 \times 150$$

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

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.

