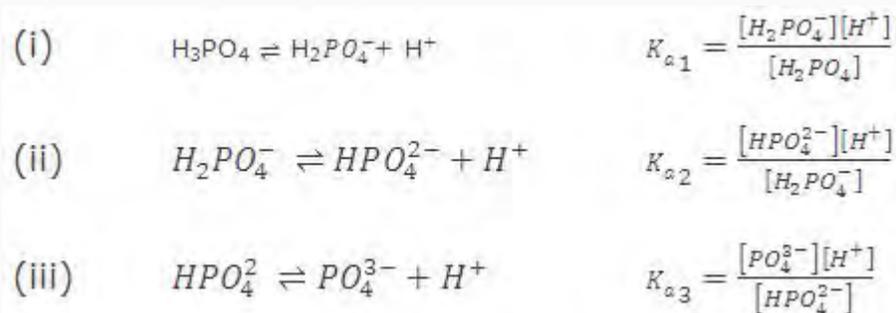


SALT OF A STRONG ACID AND A STRONG BASE

Such a salt, say NaCl, does not undergo **hydrolysis** as both the ions are not reactive. The solution is thus, neutral in nature.

Hydrolysis of Amphiprotic Anion:

Let us consider hydrolysis of **amphiprotic anion** only, i.e., when counter cation is not hydrolysed, example of some salts of this category are NaHCO_3 , NaHS , Na_2HPO_4 , NaH_2PO_4 .



Here, H_2PO_4^- and HPO_4^{2-} are **amphiprotic anions**. pH after their **hydrolysis** can be calculated as,

$$\text{pH of } \text{H}_2\text{PO}_4^- \text{ in aqueous medium} = (\text{p}K_{a1} + \text{p}K_{a2})/2$$

$$\text{pH of } \text{HPO}_4^{2-} \text{ in aqueous medium} = (\text{p}K_{a2} + \text{p}K_{a3})/2$$

Here, H_2PO_4^- is conjugate base of H_3PO_4 and H_3PO_4 is conjugate acid of H_2PO_4^- .

Similarly, PO_4^{3-} is conjugate base of HPO_4^{2-} and HPO_4^{2-} is conjugate acid of PO_4^{3-} .

(iv) Let us consider **amphiprotic** bicarbonate anion.

3. NH ₄ Cl (Strong acid + Weak base)	Acidic	$h = \sqrt{kw/Ckb}$	$K_h = kw/Ckb$	$pH = 1/2[pkw - pkb - \log C]$
4. CH ₃ COONH ₄ (Weak acid + Weak base)	*	$h = \sqrt{kw/(ka + kb)}$	$K_h = kw/(ka + kb)$	$pH = 1/2[pkw + pka - pkb]$

In the case of salt of weak acid and weak base, nature of medium after **hydrolysis** decided in the following manner:

- (i) If $K_a = K_b$, the medium will be neutral.
- (ii) If $K_a > K_b$, the medium will be acidic.
- (iii) If $K_a < K_b$, the medium will be basic.

The degree of **hydrolysis** of salts of weak acids and weak bases is unaffected by dilution because there is no concentration term in the expression of degree of **hydrolysis**.

Note : Degree of **hydrolysis** always increases with increase in temperature because at elevated temperature increase in K_w is greater as compared to K_a and K_b .

Source : <http://ciseche10.files.wordpress.com/2013/12/ionic-equilibrium.pdf>