DETERMINING STRENGTHS OF ACIDS AND BASES

Only those acids and bases that do not completely dissociate in water will use the following formulas. On most occasions, the number of cation particles will be in equilibrium with the number of anion particles (often in a 1:1 ratio, but always in a predictable manner).

DETERMINING STRENGTHS OF ACIDS

Formula:

$$K_a = \frac{[H_3O^+][A^-]}{[HA][H_2O]}$$

K_a = acid dissociation constant (no units)

$[H_3O^+]$ = hydronium (or hydrogen ion) concentration, M – usually given in the problem

$[A^-]$ = concentration of the anion, M (if the solution is in equilibrium, this value will be the same as the value for $[H_3O^+]$)

$[HA]$ = concentration of the acid, M

$[H_2O]$ = concentration of water – always 1.0 M because water is a spectator ion