Chem M3LC. R. Corn

Monoprotic Weak Acid And Salt

Constants: Ka, Kw, C0HA, C0A

Five species: [HA], [A-], [H+], [OH-], [Na+]

Ka = [H+][A-]/[HA] base dissociation

Kw = [H+][OH-] water dissociation

[Na+] + [H+] = [A-] + [OH-] charge balance

C0HA + C0A = [HA] + [A-] mass balance 1

C0A = [Na+] mass balance 2

Full Formal Equation for [H+]

[H+]= Ka[HA] /[A-]

[A-] = C0A + [H+] – [OH-]

[HA] = C0HA - [H+] + [OH-]

[H+]= Ka(C0HA - [H+] + [OH-])/(C0A + [H+] – [OH-])

Equations for C0HA and C0A bigger than Ka:

Initial guess: [H+]= Ka*C0HA/C0A

Acidic Solution: [H+]= Ka(C0HA - [H+])/(C0A + [H+])

Basic Solution: [OH-] = Kb(C0A - [OH-])/(C0HA + [OH-])

Can either iterate or solve quadratic