Titration Curve
weak base with strong acid

The **START** of the titration is the same as a regular (type 1) weak base problem. You know K_b and [B] so you can calculate pH.

$$B + H_2O \rightleftharpoons BH^+ + OH^-$$

buffer zone

a "type 2" calculation

conjugate ratios are known, use Henderson-Hasselbach to calculate pH. pH's are generally above 7 here.

pH = 7.00 ——————— pH = 7.00

pH

The **equivalence point** (endpoint) is the same as a regular (type 1) salt of a weak base problem (BHX). You know [BH$^+$] and you can calculate pH. Also note that the pH must be *less than 7* due to the ionization of BH$^+$.

$$BH^+ \rightleftharpoons B + H^+$$

overshoot

This region is calculated simply by determining the amount of

H^+ in EXCESS that has been added. No equilibrium calculations necessary.

mL of acid added

The half-way point is important!

After you have determined the equivalence point (endpoint) of the titration, go to half that value. The pH at the half-titration point is equal to the pK_a of the weak acid, BH$^+$. To get the pK_b of the base (B) you MUST subtract the pK_a from 14. The reason for this is that the pOH is actually what equals the pK_b.

$$pK_b = 14 - pK_a$$

pH = pK_a

for BH$^+$!

endpoint (complete titration)

half titration