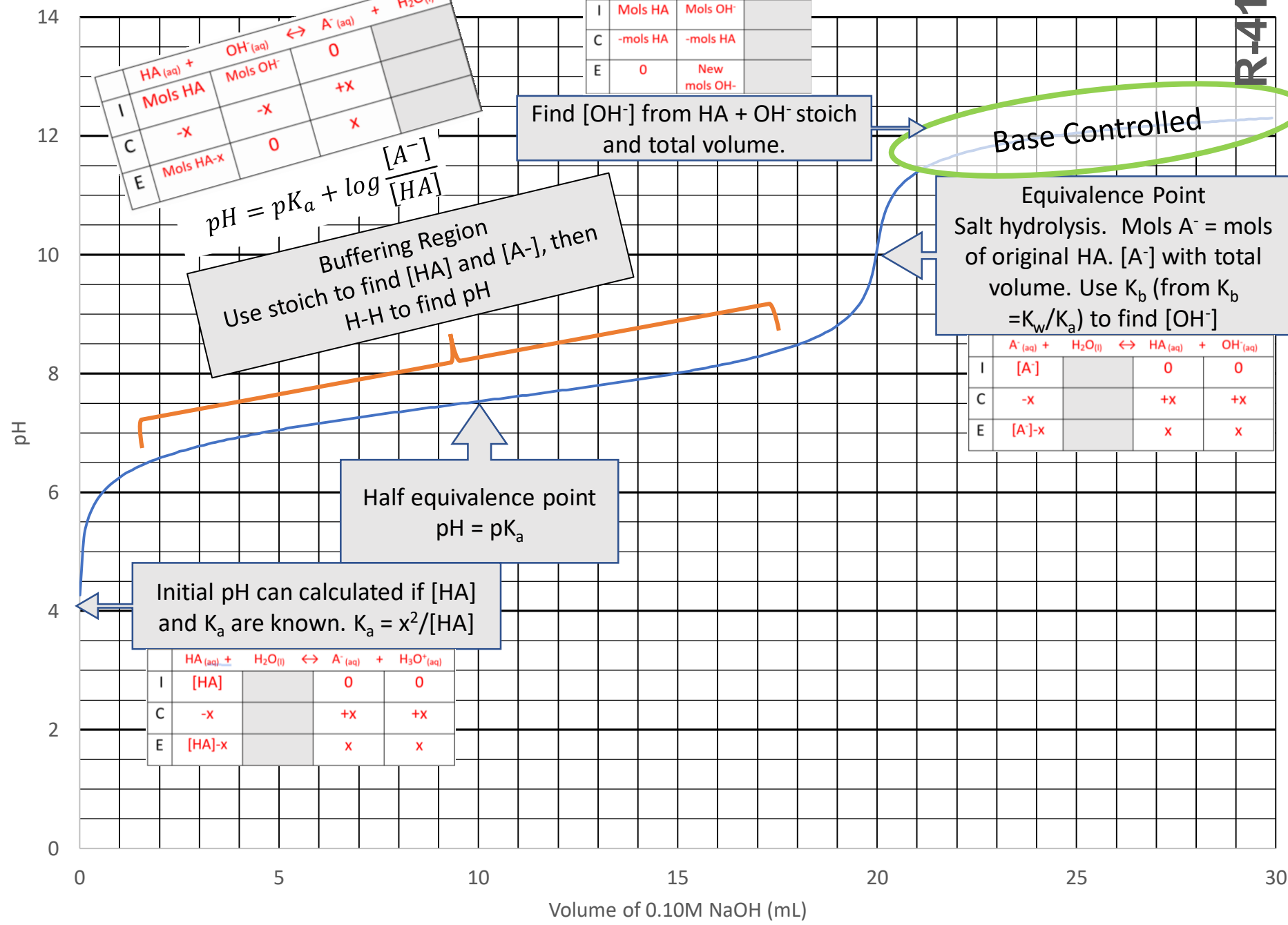


20.0mL of Unknown Monoprotic Acid Solution

R-41



	$HA_{(aq)} + OH^-_{(aq)}$	\leftrightarrow	$A^-_{(aq)} + H_2O_{(l)}$
I	Mols HA		0
C	-x		+x
E	Mols HA-x		x

	$H^+_{(aq)} + OH^-_{(aq)}$	\leftrightarrow	$H_2O_{(aq)}$
I	Mols H^+		
C	-mols H^+		
E	0		New mols OH^-

Find $[OH^-]$ from HA + OH^- stoich and total volume.

Equivalence Point
Salt hydrolysis. Mols A^- = mols of original HA. $[A^-]$ with total volume. Use K_b (from $K_b = K_w/K_a$) to find $[OH^-]$

	$A^-_{(aq)} + H_2O_{(l)}$	\leftrightarrow	$HA_{(aq)} + OH^-_{(aq)}$
I	$[A^-]$		0
C	-x		+x
E	$[A^-]-x$		x

Initial pH can be calculated if $[HA]$ and K_a are known. $K_a = x^2/[HA]$

	$HA_{(aq)} + H_2O_{(l)}$	\leftrightarrow	$A^-_{(aq)} + H_3O^+_{(aq)}$
I	$[HA]$		0
C	-x		+x
E	$[HA]-x$		x

Half equivalence point
 $pH = pK_a$

20.0mL of Unknown Ammonia Solution

	$B_{(aq)} + H_2O_{(l)} \leftrightarrow BH^+_{(aq)} + OH^-_{(aq)}$
I	[B] 0 0
C	-x +x +x
E	[B]-x x x

Initial pH can be calculated if [B] and K_b are known. $K_b = x^2/[B]$.

Half equivalence point
 $pOH = pK_b$

Buffering Region
Use stoich to find [B] and [BH⁺], then H-H to find pH

	$B_{(aq)} + H_3O^+_{(l)} \leftrightarrow BH^+_{(aq)} + H_2O_{(l)}$
I	Mols B Mols H_3O^+ 0 0
C	-x -x +x +x
E	Mols B-x 0 +x x

$pOH = pK_b + \log \frac{[BH^+]}{[B]}$

	$BH^+_{(aq)} + H_2O_{(l)} \leftrightarrow B_{(aq)} + H_3O^+_{(aq)}$
I	[BH ⁺] 0 0
C	-x +x +x
E	[BH ⁺]-x x x

Equivalence Point
Salt hydrolysis. Mols BH⁺ = mols of original B. [BH⁺] with total volume. Use K_a (from $K_a = K_w/K_b$) to find [H₃O⁺]

Or, find K_a and use acid H-H where $HA = BH^+$ and $A^- = B$

Find [H₃O⁺] from H⁺ + B stoich and total volume.

	$H^+_{(aq)} + OH^- \leftrightarrow H_2O_{(aq)}$
I	Mols H ⁺ Mols B
C	-mols B -mols B
E	New mols H ⁺ 0

Acid Controlled

