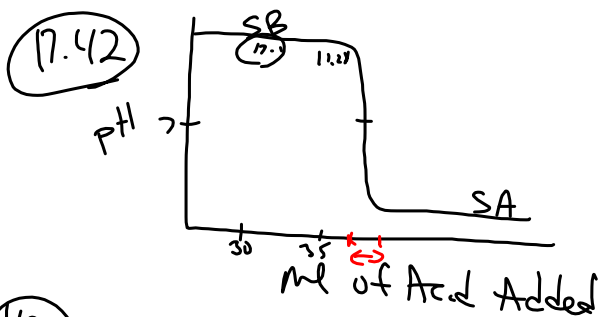


(17405) $22.5 \text{ mL } 0.118 \text{ M } \text{NH}_3(aq) = \text{NH}_3 + \text{HOH}$
 $+ 0.105 \text{ M } \text{HCl}$ NH_4OH

(A) $\text{MMQ} = \text{MMQ}$ (B)
 $(1)(0.105) \text{ mL} = (1)(0.118)(22.5)$

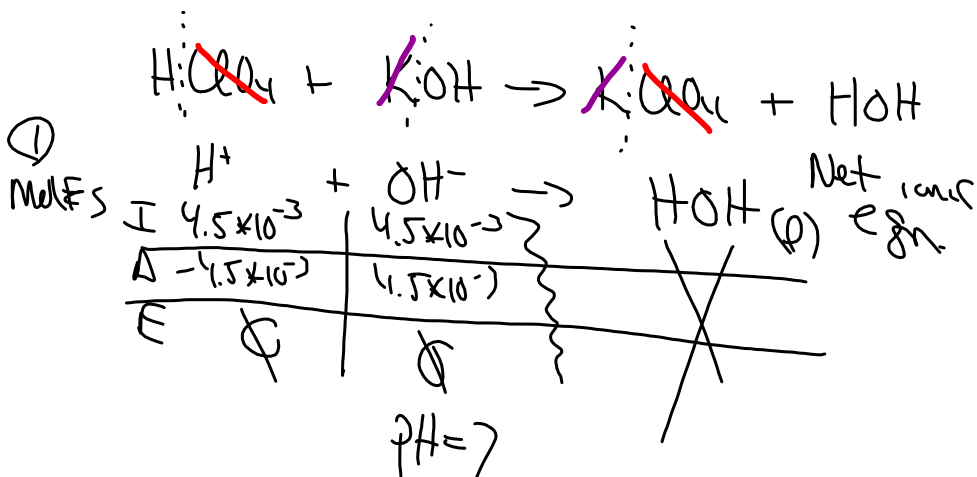
$\text{H}^+ = \text{A}_3\text{O}^+$
 $\text{H}^+ + \text{HOH}$

25.3 mL



- ① Net \leftrightarrow Mole, **FILE**
- ② Recak New M
- ③ Find pH

(42c) $36 \text{ mL } 0.125 \text{ M } \text{HClO}_4 + 30 \text{ mL } 0.150 \text{ M } \text{KOH}$



(12d) 30ml 0.150M KOH + 37ml 0.125M HClO₄

① Next
Moles

	H ⁺	+ OH ⁻	→ HOH
I	4.625 × 10 ⁻³	4.5 × 10 ⁻³	
Δ	-4.5 × 10 ⁻³	-4.5 × 10 ⁻³	
E	0.125 × 10 ⁻³	0	

mole H⁺

② Result
M

$[H^+] = 1.87 \times 10^{-3} M$

pH = 2.73

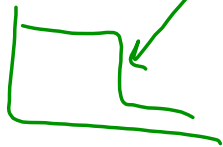
30ml
0.15M KOH

+

ml
0.125M HClO₄

- Ⓐ
- Ⓑ
- Ⓒ
- Ⓓ

30ml pH = 12
 35ml pH = 11.29
 36ml pH = >
 37ml pH = 2.73



17.413 35 ml 0.15M HOAc + _ ml 0.15M NaOH
WA SB

a) 0 ml
 pH 35 ml 0.15M HOAc. (H₂C₂H₃O₂)

I	HOAc	→	H ⁺	+	OAc ⁻
Δ	-x		+x		+x
E	0.15-x		x		x

pH = -log H⁺

2.784

$K_a \frac{x^2}{0.15} = 1.8 \times 10^{-5}$

$[H^+] = x = 1.64 \times 10^{-3}$ (1.1% ionized)

b) 35 ml 0.15M HOAc + 17.5 ml 0.15M NaOH

① Neut (Mdes)

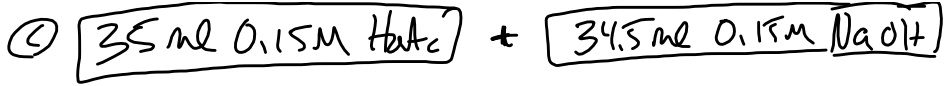
~~HOAc + NaOH~~ → ~~NaOAc~~ + HOH.

I	5.25 × 10⁻³	2.625 × 10⁻³	+	2.625 × 10⁻³
Δ	-2.625 × 10⁻³	-2.625 × 10⁻³	+	2.625 × 10⁻³
E	2.625 × 10⁻³	0	+	2.625 × 10⁻³

(2) Result M
5.25 × 10⁻³ M 0.05M HOAc A
5.25 × 10⁻³ M 0.05M OAc⁻ CB

pH = pKa + log $\frac{b}{a}$

= -log (1.8 × 10⁻⁵) + log $\frac{0.05}{0.05}$ = 4.74



① Net Molar

	H_2Ac^-	OH^-	Ac^-	HOH
I	5.25×10^{-3}	5.175×10^{-3}	0	
Δ	-5.175	-5.175	$+5.175$	
E	7.5×10^{-5}	0	5.175×10^{-3}	

② Reconc M

$69.5 \times 10^{-3} \text{ p}$

$1.08 \times 10^{-3} \text{ M } \text{H}_2\text{Ac}^-$

$7.45 \times 10^{-2} \text{ M } \text{Ac}^-$

$\text{pH} = -\log 1.8 \times 10^{-5} + \log \frac{7.45 \times 10^{-2}}{1.08 \times 10^{-3}}$

$\text{pH} = 6.58$



① Net Molar

	H_2Ac^-	OH^-	Ac^-	HOH
I	5.25×10^{-3}	5.25×10^{-3}	0	
Δ	-5.25×10^{-3}	-5.25×10^{-3}	$+5.25 \times 10^{-3}$	
E	0	0	5.25×10^{-3}	

② Reconc M

$70 \times 10^{-3} \text{ p}$

$0.075 \text{ M } \text{Ac}^-$

$\text{pH} = ?$

AT EQ Point = Molar

W/S: Bl. Base H^+ acceptor

No H^+ , No OH^- ???

ADD H_2O !!!

	Ac^-	HOH	H_2Ac^-	OH^-
I	0.075 M		0	0
Δ	$-x$		$+x$	$+x$
E	$0.075 - x$		x	x

$K_a = 1.8 \times 10^{-5}$

$K_b = ?$

$K_a \times K_b = K_w$

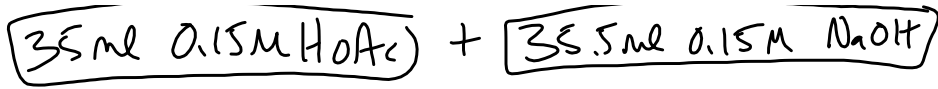
$K_b = \frac{(x)(x)}{0.075} = 5.56 \times 10^{-10}$

$x = 6.45 \times 10^{-6} = (\text{H}_2\text{Ac}^-) = (\text{OH}^-)$

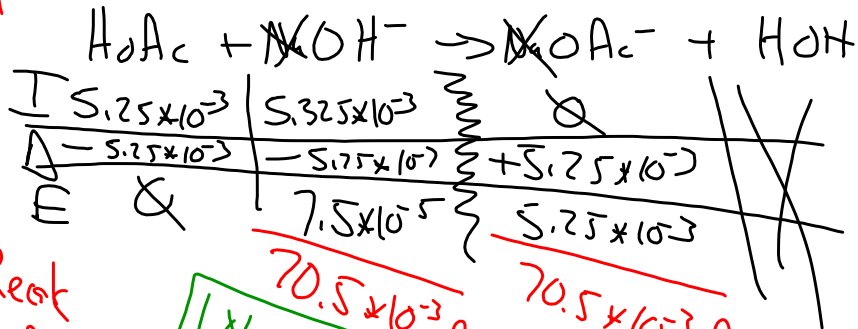
$\text{pOH} = -\log(\text{OH}) = 5.19$

$\text{pH} + \text{pOH} = 14$

$\text{pH} = 8.81$



D Net
Moles



Q React
M

$70.5 \times 10^{-3} \text{ l}$
 $1.06 \times 10^{-3} \text{ M OH}^-$
 SB

$70.5 \times 10^{-3} \text{ l}$
 $7.45 \times 10^{-3} \text{ M OAc}^-$
 WP

$\text{pOH} = -\log(\text{OH}^-)$
 $= 2.97$

$\text{pH} = 11.03$

insignificant
too small

Base added to ^{35 ml} 0.15M HOAc

Base added	pH
0	2.784
17.5 ml	4.74
34.5	6.58
35	8.81
35.5	11.03

Equivalence Pt. at 35 ml

HW
17/44 a → e

