

(17.28) (a) $\frac{0.1 \text{ mole } 0.1 \text{ H Prop}}{1.5 \text{ L}} \rightarrow 0.067 \text{ M}$ (WA), $\frac{0.13 \text{ mole Na Prop}}{1.5 \text{ L}} \rightarrow 0.087 \text{ M}$ (Basic Salt, Conj. Base)

NaOH (SB) + H Prop (WA)

$$\text{pH} = \text{p}K_a + \log\left(\frac{[b]}{[a]}\right)$$

$$\text{pH} = -\log(1.3 \times 10^{-5}) + \log\left(\frac{0.087}{0.067}\right) = 4.99995 \approx 5.0$$

Mar 6-7:39 AM

(17.28b) Add 0.01 mole NaOH

Self? - What part of buffer will stop/dec. the NaOH effect on soln.

$$\text{H Prop} + \text{NaOH} \rightarrow \text{Na Prop} + \text{H}_2\text{O}$$

ICE	H Prop	+ OH ⁻	→	Prop ⁻	+ H ₂ O
I	0.1	0.01		0.13	
Δ	-0.01	-0.01		+0.01	
E	0.09	0		0.14	

Recalc new M (1.5 L):
 H Prop: $\frac{0.09}{1.5} = 0.06 \text{ M}$ (WA)
 Prop⁻: $\frac{0.14}{1.5} = 0.093 \text{ M}$ (Conj. B)

$$\text{pH} = \text{p}K_a + \log\left(\frac{[b]}{[a]}\right)$$

$$= -\log(1.3 \times 10^{-5}) + \log\left(\frac{0.093}{0.06}\right) = 5.08$$

Mar 6-7:57 AM

17.28c O.d mde HI Self? Na Prop CB Prop

~~HI~~ + ~~Na Prop~~ → ~~NaI~~ + H Prop

Mole
RICE
Next

I	0.01	0.13	0.1
D	-0.01	-0.01	+ 0.01
E	0	0.12 <u>WA</u>	0.11 <u>WA</u>

1.5p
0.08M Prop-
0.073M H Prop

Peak
M

PH = 4.925p
PH = pKa + log($\frac{b}{a}$)

Mar 6-8:07 AM

PS17

① $H_2Ac \rightleftharpoons H^+ + Ac^-$

WA

② $H_2CN \rightleftharpoons H^+ + CN^-$

I	0.1	0	0.1
D	-x	+x	+x
E	0.1-x	x	0.1+x

Sol. Salt

$KCN \rightarrow K^+ + CN^-$

Given

Mar 6-8:16 AM

(3) 0.75 mole NH_3 0.25 mole NH_4Cl (12)
W.B. Salt of WB
 $K_a \times K_b = K_w$ $K_b = 1.8 \times 10^{-5}$
 $\text{pH} = \text{p}K_a + \log \frac{[b]}{[a]}$ OR $\text{pOH} = \text{p}K_b + \log \frac{[a]}{[b]}$
 $\text{pH} = -\log(5.56 \times 10^{-11}) + \log \frac{0.75\text{M}}{0.25\text{M}}$

Mar 6-8:18 AM

(11) 50ml 1M K_2A_2 + 50ml 1M H_2A_2 (WA)
Salt of WA. $K_a = 1.8 \times 10^{-5}$
 $\text{pH} = \text{p}K_a + \log \frac{[b]}{[a]}$
 $= -\log(1.8 \times 10^{-5}) + \log \frac{1}{1}$
4.74

Mar 6-8:24 AM

HW

PS 17-2 #1-8 skip #6

Text 17.27

Mar 6-8:26 AM