

17/6b 0.21M Pyr + 0.35M pH

C_5H_5N C_5H_5NHCl

$K_b = 1.7 \times 10^{-9}$ B A

$$pH = pK_a + \log \frac{[base]}{[Acid]}$$

$$pH = \log(5.88 \times 10^{-6}) + \log \frac{0.21}{0.35}$$

$$pH = 5.0086 = 5.01$$

$pK_a = -\log K_a$
p
 $K_a \times K_b = K_w$
 $K_a (1.7 \times 10^{-9}) = 1 \times 10^{-14}$
 $K_a = 5.88 \times 10^{-6}$

Mar 2-7:41 AM

0.21M Pyr + 0.35M HPyr $K_a = 5.88 \times 10^{-6}$

$$HPyr \rightarrow H^+ + Pyr^-$$

I	0.35	}	x	}	0 + 0.21
D	-x	}	+x	}	+x
E	0.35-x	}	x	}	0.21+x

$$K_a = \frac{x(0.21+x)}{0.35-x} = 5.88 \times 10^{-6}$$

$(H^+) \quad x = 9.8 \times 10^{-6}$

$pH = -\log(H^+)$
 $pH = 5.00877$
 5.01

Mar 2-8:21 AM

Buffer

Weak Acid + Salt of the WA
 $\text{HOAc} + \text{NaOAc}$
 $\text{H}^+ \quad \text{OAc}^-$

p125
Salt
Solubility

Soluble salts diss. 100%
 $\text{NaOAc} \rightarrow \text{Na}^+ + \text{OAc}^-$

Use NET ionic eqn

Mar 2-8:27 AM

WA $\text{HA} \rightarrow \text{H}^+ + \text{A}^-$

$K_a = \frac{[\text{H}^+][\text{A}^-]}{[\text{HA}]}$

$\frac{[\text{H}^+]}{1} = \frac{K_a [\text{HA}]}{[\text{A}^-]}$

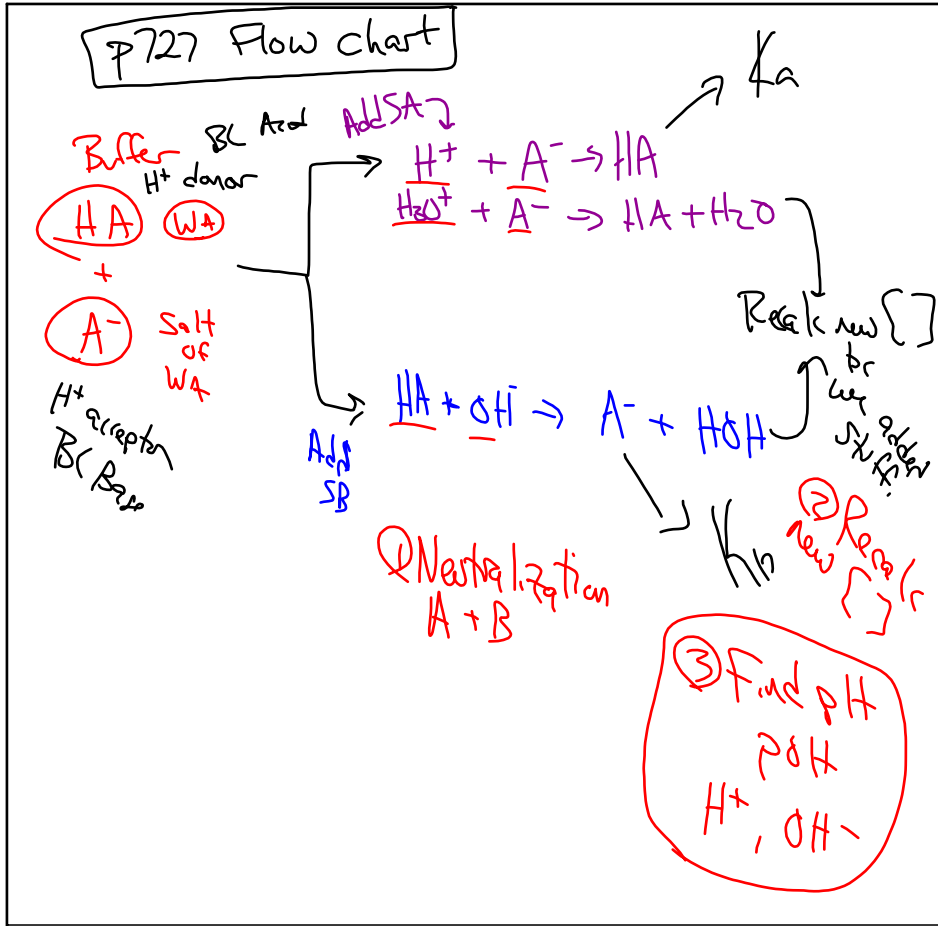
$-\log [\text{H}^+] = -\log \left[\frac{K_a [\text{HA}]}{[\text{A}^-]} \right]$ } $\log AB = \log A + \log B$

$\text{pH} = -\log [K_a] + \log \frac{[\text{HA}]}{[\text{A}^-]}$ ← WA ← salt of WA

$\text{pH} = \text{p}K_a + \log \frac{[\text{A}^-]}{[\text{HA}]}$ HH

Common Ion!

Mar 2-8:30 AM



Mar 2-8:36 AM

17 / 22 + 23

Old stuff HA

Some new follow p727 for part b

Mar 2-8:44 AM