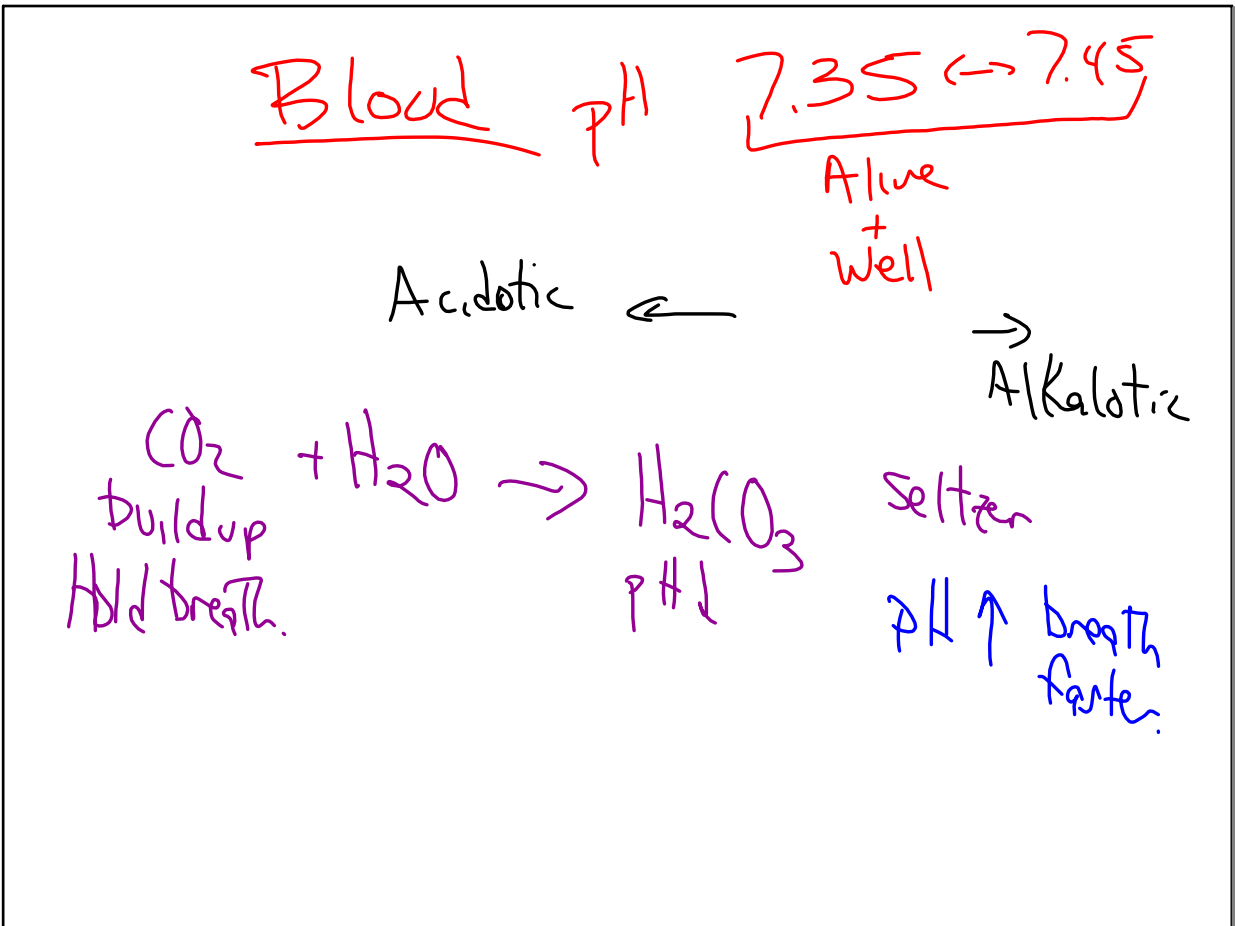


Mar 3-7:34 AM



Mar 3-8:21 AM

1722b) 65 ml 0.2M NaHCO₃ + 75 ml 0.15M Na₂CO₃

$K_a = \frac{[H^+][CO_3^{2-}]}{[HCO_3^-]} = 5.6 \times 10^{-11}$

NaHCO ₃	Na ₂ CO ₃
M × L	M × L
(0.2)(65 × 10 ⁻³ L)	(0.15)(75 × 10 ⁻³ L)
0.013 mole NaHCO ₃	0.01125 mole Na ₂ CO ₃
0.14 L	0.14 L
0.093M NaHCO ₃	0.08M Na ₂ CO ₃

① Convert to moles
② Calc. New M
Moles = M × L
New pH Volume

$pH = -\log(5.6 \times 10^{-11}) + \log \frac{0.08}{0.093}$

$K_a = \frac{[H^+][CO_3^{2-}]}{[HCO_3^-]} = 5.6 \times 10^{-11}$

$[H^+] = 6.51 \times 10^{-11}$

$pH = 10.19$

Mar 3-8:39 AM

Buffer (wk) H₂Ac + NaOAc⁻ CB [pH = 4.74]

0.3mole → 1L soln ← 0.3mole

① Calc New pH after adding 0.02mole NaOH

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

$pH = -\log(1.8 \times 10^{-5}) + \log \frac{0.3 \text{ OAc}^-}{0.3 \text{ AcH}}$

$pH = 4.74$

Mar 3-8:57 AM

① add 0.02 mole NaOH (SB) P727 Flow chart.

(HX)	H_2Ac	+	oAc^-
(12)	0.3 mole		0.3 mole
	0.3M		0.3M

① Neutralize (use moles)!

$$H_2Ac + OH^- \rightarrow oAc^- + H_2O$$

(Moles)	I	0.3	0.02		0.3
(Sub + smaller #)	Δ	-0.02	-0.02		+0.02
	E	0.28 mole			0.32 mole

② Recalc new M → (12)

0.28M H_2Ac and 0.32M oAc^-

$$pH = pK_a + \log \frac{b}{a} = -\log(1.8 \times 10^{-5}) + \log \frac{0.32}{0.28}$$

(4.74) New pH = 4.8 after add 0.2 mole NaOH

Mar 3-9:02 AM

H_2Ac	+	oAc^-	
0.3 mole	(12)	0.3 mole	

Add 0.2 mole HCl SA

!!! P727 !!!

① Next using moles

(Moles)	I	oAc^-	+	H^+	→	H_2Ac
		0.3		0.2		0.3
	Δ	-0.2		-0.2		+0.2
	E	0.1				0.5

(Subt. smaller #)

② Recalc new M

0.1M oAc^- 0.5M H_2Ac

③ $pH = -\log(1.8 \times 10^{-5}) + \log \frac{0.1}{0.5} = 4.04$

Mar 3-9:15 AM

(17.24) 7g NH_3 (B) + $20\text{g NH}_4\text{Cl}$ (A) 2.5L
 $K_b = 1.8 \times 10^{-5}$ has more H^+ pH = ?

$\text{pH} = \text{p}K_a + \log \frac{[\text{b}]}{[\text{a}]}$
 $= -\log(5.56 \times 10^{-10}) + \log \frac{0.165}{0.151}$

$\text{pH} = 9.29$

$\text{NH}_4\text{Cl} \rightleftharpoons \text{NH}_4^+ + \text{Cl}^-$
 $K_a \times K_b = K_w \quad K_a = 5.56 \times 10^{-10}$

7g NH_3		mole NH_3	=	0.165M NH_3
2.5L		7g NH_3		

$20\text{g NH}_4\text{Cl}$		mole NH_4Cl	=	0.151M
2.5L		$20\text{g NH}_4\text{Cl}$		

Mar 3-9:23 AM

17 / 30

Mar 3-9:31 AM