

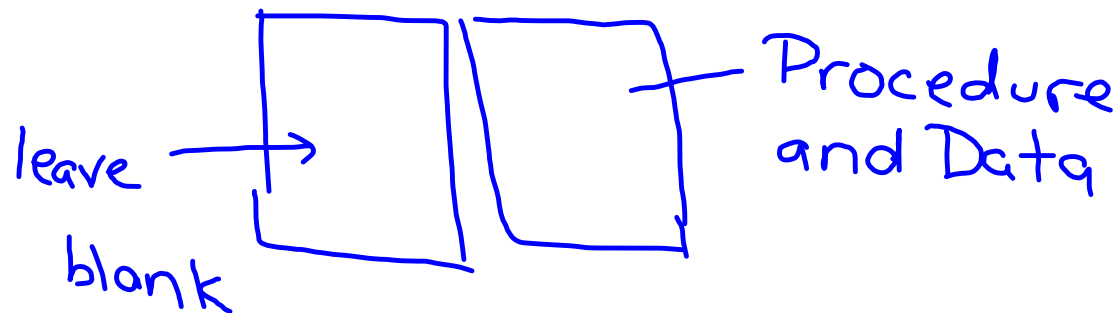
EE or EXP

log and 10^x

10^x
log

Composition notebook

- ① title
- ② purpose
- ③ Procedure
- ④ Data (Show work)



- ⑤ Conclusion - Questions at the end of the lab.

$$\textcircled{1} \quad \frac{\text{moles of solute}}{\text{L of soln}} = \text{Molarity}$$

Molar
"Big M"

$$\text{mole} = \frac{\text{g}}{\text{molecular mass}}$$

$$\text{Zn} \quad \frac{193\text{g} \times 1\text{mol}}{30\text{g}} = 6.433\text{ mol}$$

$$\text{Zn} \quad \frac{193\text{g} \times 1\text{mol}}{65\text{g}} = 2.9692\text{ mol}$$

2.97 mol

$$\textcircled{1} \quad \frac{\text{moles of solute}}{\text{L of soln}} = M$$

$$\frac{x}{.250 \text{ L}} = \frac{.100 \text{ M}}{1}$$

$$\underline{x = .025 \text{ mol}}$$

KHP

$$\text{H} 1 \times 5 = 5$$

$$\text{C} 12 \times 8 = 96$$

$$\text{O} 16 \times 4 = 64$$

$$\text{K} 39 \times 1 = 39$$

$$\underline{204 \text{ g}} = 1 \text{ mol}$$

$$\frac{.025 \text{ mol} \times 204 \text{ g}}{1 \text{ mol}} =$$

$$5.1 \text{ g}$$

$$\textcircled{5.10 \text{ g}}$$

2.

$$\frac{x}{.100L} = 0.0500M$$

$$x = .005\text{mol}$$

$$\frac{.005\text{mol} \times 204\text{g}}{1\text{mol}} = 1.02\text{g}$$

$$3 \quad M_1 V_1 = M_2 V_2$$

$$(.100)(10.45) = x(9.35)$$

$$\frac{1.045}{9.35} = \frac{x(9.35)}{9.35}$$

$$x = .11764 \text{ M}$$

$$x = .112 \text{ M}$$

4.

$$M_1 V_1 = M_2 V_2$$

$$(.05)(5) = x(13.45)$$

$$x = .019 M$$

$$x = .0186 M$$

5.

$$M_1 v_1 = M_2 v_2$$

$$(3.2)(12.45) = x(35.45)$$

$$x = 1.124 \text{ M}$$

$$x = 1.1 \text{ M}$$

	base	acid
3	OH	H
	Salt	
	metal/nonmetal	

↳ H

$$\underbrace{.06}^{1-9} \quad \underbrace{6 \times 10^{-2}}^{1-9}$$

$$\begin{array}{ccccccc} [H^+] & [OH^-] & pOH & + & pH & = & 14 \\ 6 \times 10^{-2} & 2 \times 10^{-13} & 12.8 & & 1.2 & & \end{array}$$

$$\begin{array}{c} \nearrow \\ 10^{-12.8} \\ 10^x - \text{anti log} \\ \log \\ \searrow \\ 10^{-1.2} \end{array}$$

6 e.

$[H^+]$	$[OH^-]$	pOH	pH
3.80×10^{-6}		8.580	5.420

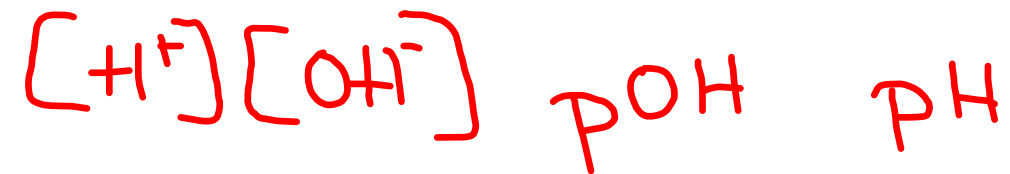
② 3.00×10^{-9} .0000000003 3

① 2.0×10^{-9} .0000000002 2

④ 2.63×10^{-9}

Thurs Quiz

- 1) Show the chemical eq. (5)
- 2) (6)

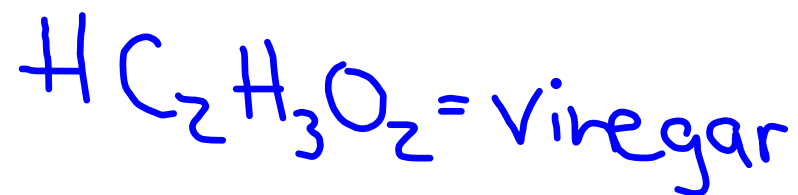


$$7. \quad \% = 100 \times \frac{\text{g of solute}}{\text{mL of soln}}$$

$$5.00\% = 100 \times \frac{x}{3780\text{mL}}$$

$$.05 = \frac{x}{3780\text{mL}}$$

$$x = 189\text{g}$$



$$8. \quad M = \frac{\text{moles}}{L}$$

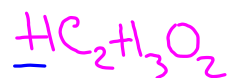
$$500\% = 100 \times \frac{g}{mL}$$

$$.05 = \frac{g}{mL} \quad \frac{.05g}{1mL}$$

$$\frac{55 \text{ miles}}{hr} \quad 55 \text{ miles} = 1 \text{ hr}$$

$$\frac{.05g}{mL}$$

$$\frac{.05g}{mL} \rightarrow M$$



$$C \ 12 \times 2 = 24$$

$$H \ 1 \times 4 = 4$$

$$O \ 16 \times 2 = 32$$

$$60g = 1 \text{ mol}$$

$$\frac{.05g \times 1 \text{ mol}}{60g} = 8.3 \times 10^{-4} \text{ mol}$$

$$\frac{8.3 \times 10^{-4} \text{ mol}}{mL}$$

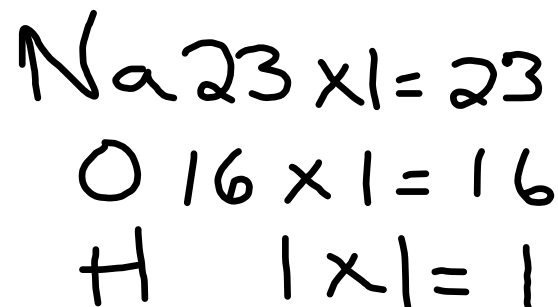
$$\frac{1mL \times 1L}{1000mL} = .001L$$

$$\frac{8.3 \times 10^{-4} \text{ mol}}{.001L} = 0.830 M$$

9. ? g NaOH 500mL 0.55 M

$$.55 = \frac{x}{.5} \quad M = \frac{\text{moles of solute}}{\text{L of soln}}$$

~~$x = .275 \text{ g}$~~
 $.275 \text{ mol}$



$$\overline{40 \text{ g} = 1 \text{ mol}}$$

$$\frac{.275 \text{ mol} \times 40 \text{ g}}{1 \text{ mol}} = 11 \text{ g}$$

10. 10.55 mL 0.25 M

8.52 mL ?

$$M_1 V_1 = M_2 V_2 \quad N_1 V_1 = N_2 V_2$$

$$(0.25)(10.55) = x(8.52)$$

$$x = 0.31 \text{ M}$$

If H^+ and OH^- are the
same # then $M = N$

$N = \text{normality}$

$$x = 0.31 \text{ N}$$

12. 15.00 mL $\text{Mg}(\underline{\text{OH}})_2$
5.43 mL .100 KHP

$$N_1 V_1 = N_2 V_2$$
$$(.100)(5.43) = x(15.00)$$

$$x = .0362 \text{ N} / 2$$

$$x = .0181 \text{ M}$$



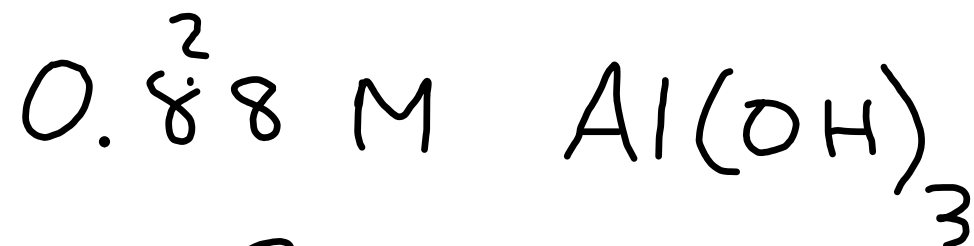
$$\frac{1 \quad 2}{0.064 \text{ N}}$$

13 a.

2.5 M HNO_3

2.5 N

h.



$$\begin{array}{r} \times \quad 3 \\ \hline 2.64\text{N} \end{array}$$

$$\text{M} \rightarrow \text{N} (\times)$$

$$\text{N} \rightarrow \text{M} (\div)$$

f. 1.43 M HC₂H₃O₂
1.43N

j 0.32M CaCl_2 Ca^{+2}

0.32M

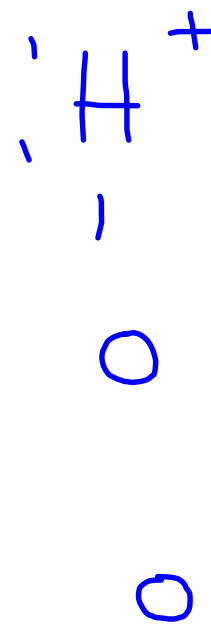
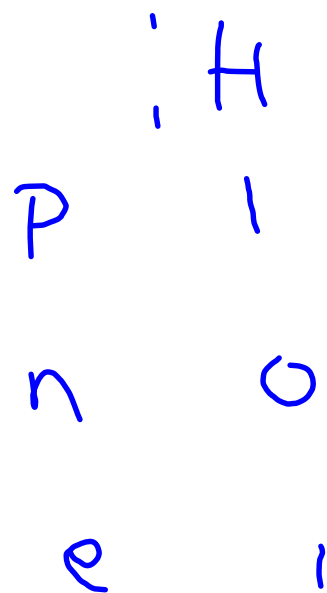
K. .032M CaCl_2 Cl^-

$\times 2$

0.064N

	H^+
mono	1
di	2
tri	3

protic



17.	K_a	pH
a) HF	6.5×10^{-4}	3.19 ± 1

does not dissociate
completely b/c it is
below 1.

d.	$[H^+]$	pH
H_3PO_4	7.52×10^{-3}	1.736
		2.124 ± 1
		3.135
		<u>2.13</u>

pH meter

4 buffer soln

7 water

10 buffer soln

Buffers

- ① Cannot be a strong acid
- ② Can only take off one hydrogen (H^+) and replace it w/ a group 1 ion.
- ③ Salt must be from the weak acid.

ex 1 NaH_2PO_3 / $NaHSO_4$ not a buffer

ex 2 NaH_2PO_4 / Na_2HPO_4 buffer

11.

a.) HCl/NaCl

Strong acid ①

b. $\text{HC}_2\text{H}_3\text{O}_2/\text{NaC}_2\text{H}_3\text{O}_2$ Yes

c. $\text{H}_2\text{CO}_3/\text{NaHCO}_3$ Yes

d. $\text{H}_3\text{PO}_4/\text{NaCl}$

No b/c of #3

e.) $\text{HC}_2\text{H}_3\text{O}_2/\text{NaH}_2\text{PO}_4$

No b/c of #3

$\text{HNO}_3 =$ nitric acid

$\text{H}_2\text{SO}_4 =$ sulfuric acid

$\text{HClO}_4 =$ per chloric acid

$\text{HCl} =$ hydrochloric acid

$\text{HBr} =$ hydrobromic acid

$\text{HI} =$ hydroiodic acid