Review 2018

Sig figs

Pacific
decimal present
- XXX 100. m
- XXX 100.0 m
- 0.00 1000 g

Atlantic
decimal absent
- 100 m
- 1000 m
- 10,000 m
- 67350 0 g

Dot diagrams TICS

transfer | covalent
ionic | share

Ionic
metal + nonmetal

$[Na]^{+1}\ [:\ddot{C}l:]^{-1}$ $[Ca]^{+2}\ 2[:\ddot{C}l:]^{-1}$

Covalent
SPLash soft, poor cond., low MP
2 nonmetals, share electrons, make molecules

Asymm. Polar

Symm non-polar

Like dissolves Like

Metallic Bonding = within a metal

ex: Mg ⊕ ions immersed in a "sea of mobile e^-"

luster, malleable, ductile, conduct due to mobile e^-

pH scale 14

$Mg(OH)_2$ Tablet

Basic $[OH^-] > [H^+]$

8 ten folding inc $[OH^-]$

7 neutral $[OH^-] = [H^+]$

6 ten folding inc $[H^+]$

HCl Tablet

Acidic $[H^+] > [OH^-]$

0

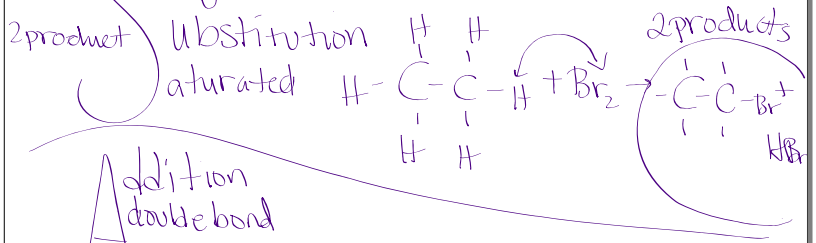
"Other theory"

"One theory"

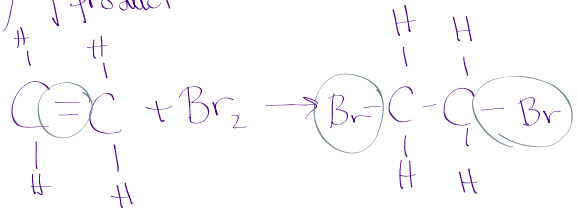
H^+ BAAD

Reactions → Organic

Substitution (2 product) — Saturated — Single bonds



Addition — double bond — product



Fermentation

$$C_6H_{12}O_6 \xrightarrow{\text{enzyme}} C_2H_5OH + CO_2$$

Combustion (burn)

$$2 C_2H_6O + 7 O_2 \rightarrow 4 CO_2 + 6 H_2O + \text{energy}$$

2 C x 2
6 H x 6
7 O 3 5 7

Esterification

Alcohol + Acid → Ester + Water
OH + COOH (COOC)

Saponification

fat + base → soap
(metal + OH)

Polymerization

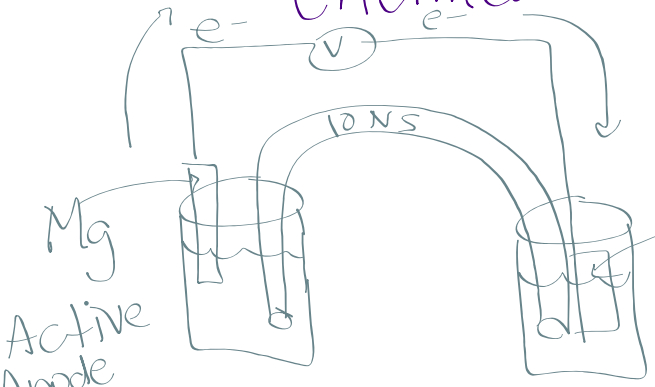
$n(\quad) \longrightarrow (\quad)_n$

Jun 18-8:54 AM

Voltaic Cells

are batteries → spontaneous redox rxns.

Chemical → electrical



Active Anode

LEO (making more ions)

Cathode

Big Red Cat (making more atoms)

GER

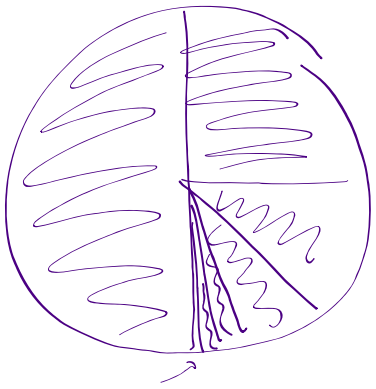
$1\left(Mg^0 \rightarrow Mg^{+2} + 2e^-\right) \quad 2\left(Cu^{+1} + e^- \rightarrow Cu^0\right)$

$2Cu^{+1} + 2e^- \rightarrow 2Cu^0$

Half Life time it takes for half a radioactive sample to decay into more stable products

half life = 12 hr

How much (% and fraction) after 3 days? $= \frac{72\text{ hrs}}{12\text{ hrs}} = 6\text{th L}$



$\frac{1}{1} \xrightarrow{①} \frac{1}{2} \xrightarrow{②} \frac{1}{4} \xrightarrow{③} \frac{1}{8} \xrightarrow{④} \frac{1}{16} \xrightarrow{⑤} \frac{1}{32} \xrightarrow{⑥} \frac{1}{64}$

$100\% \rightarrow 1.5625\%$

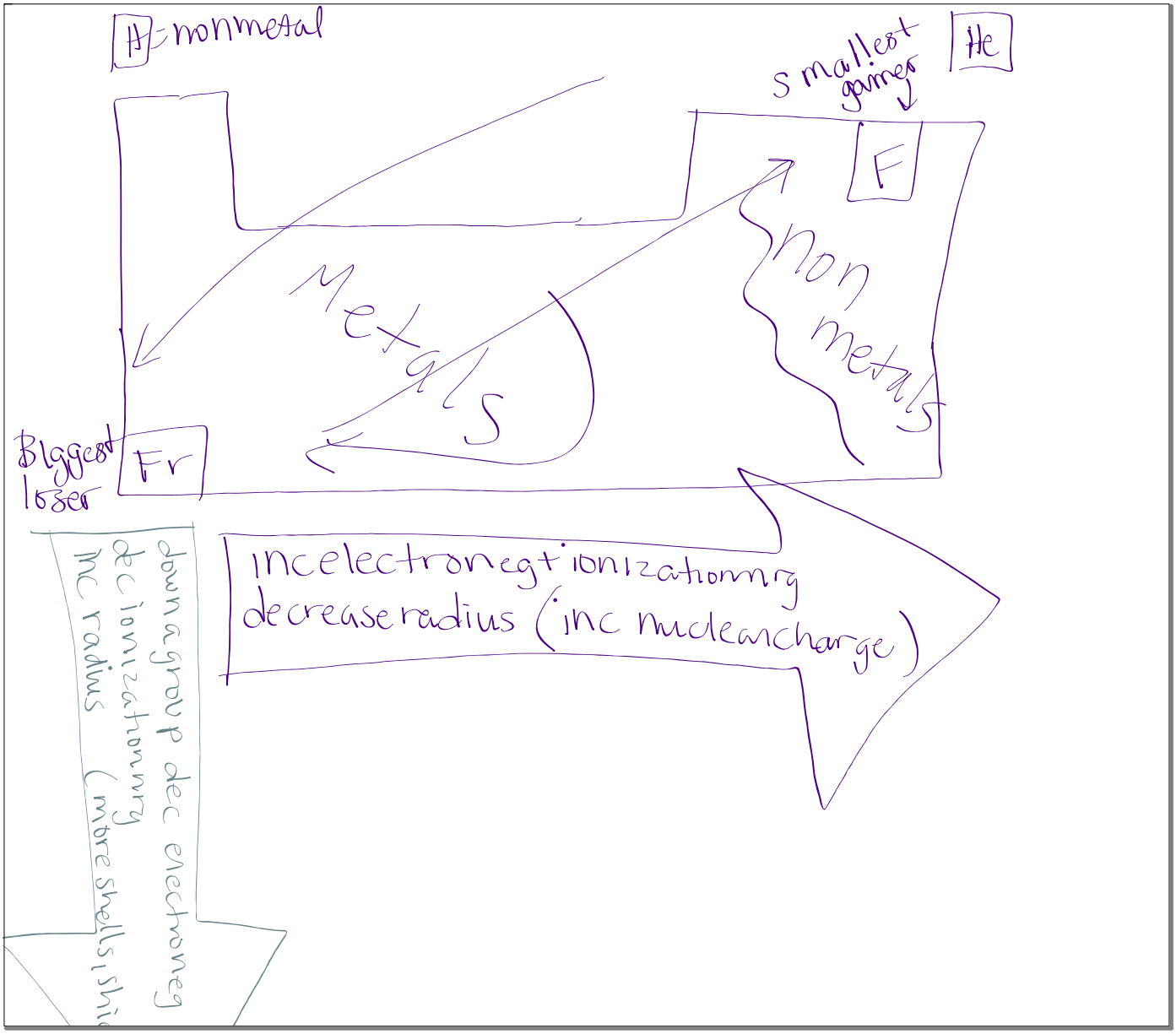
Molarity / Titration

$M_A V_A = M_B V_B$

How much of .10M HCl solution is required to completely neutralize 50.0mL of a .20M NaOH solution?

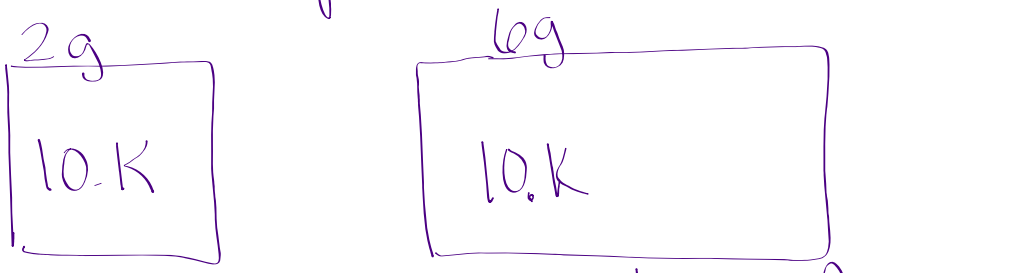
$(X)(.10M) = (50.0mL)(.20M)$

$X = 100mL$


H=nonmetal
smallest gamer
He
F
Metals
non metals
Biggest loser
Fr
inc electronegt ionization
decrease radius (inc nuclear charge)
down a group dec electroneg
dec ionization
inc radius (more shells shie

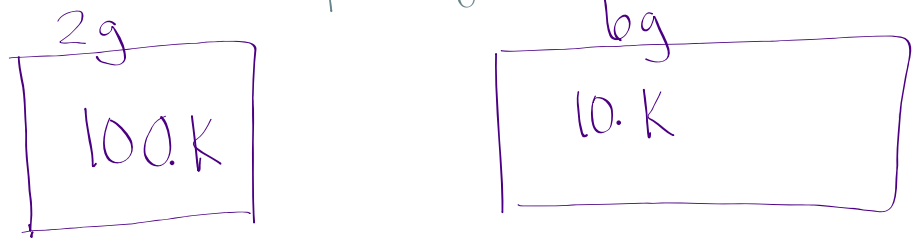
Thermal energy = heat = Q

based on temp + mass



more thermal energy (more mass)

Avg kinetic energy based on temp only!



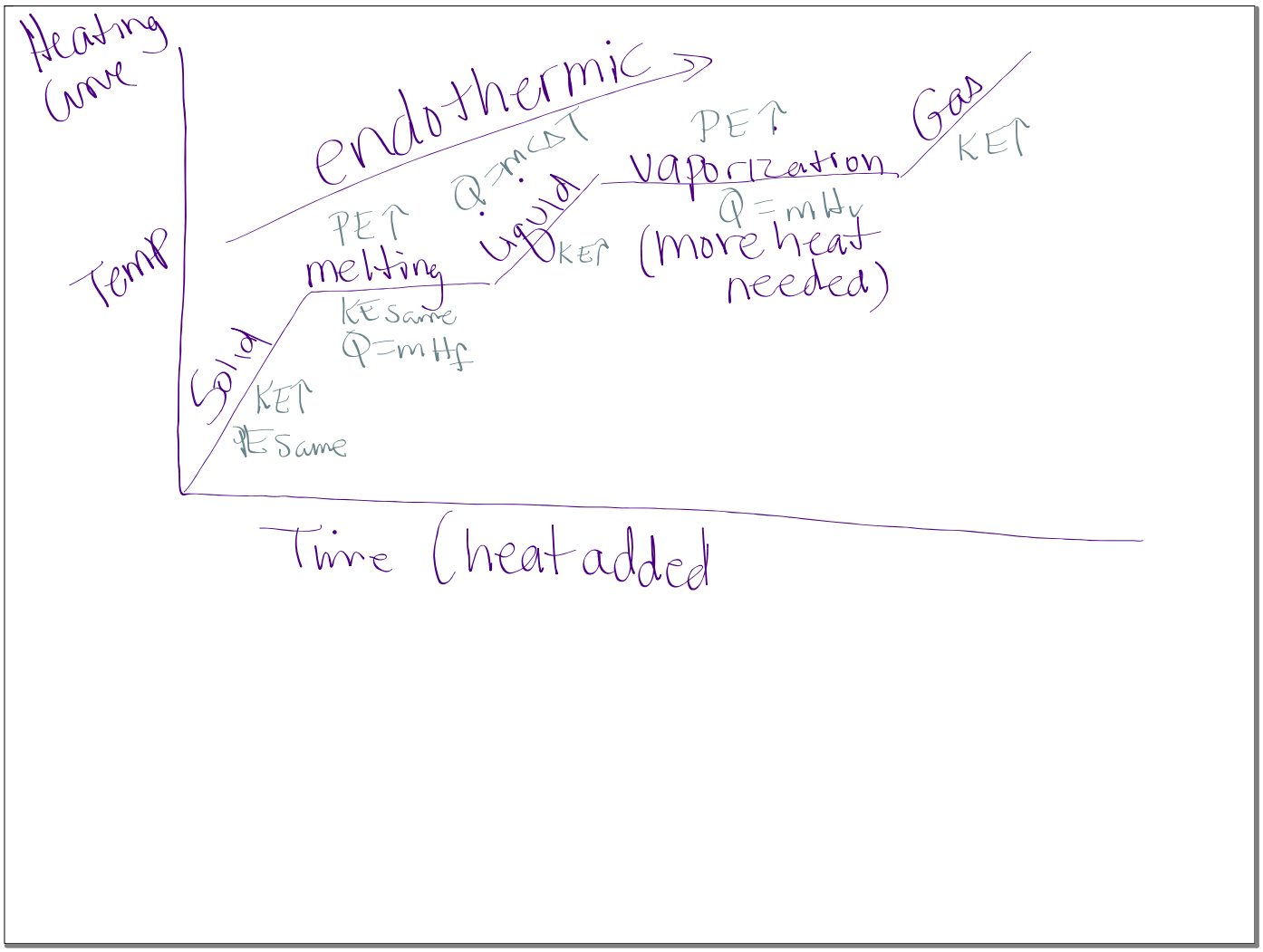
higher avg kinetic energy (higher T)

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

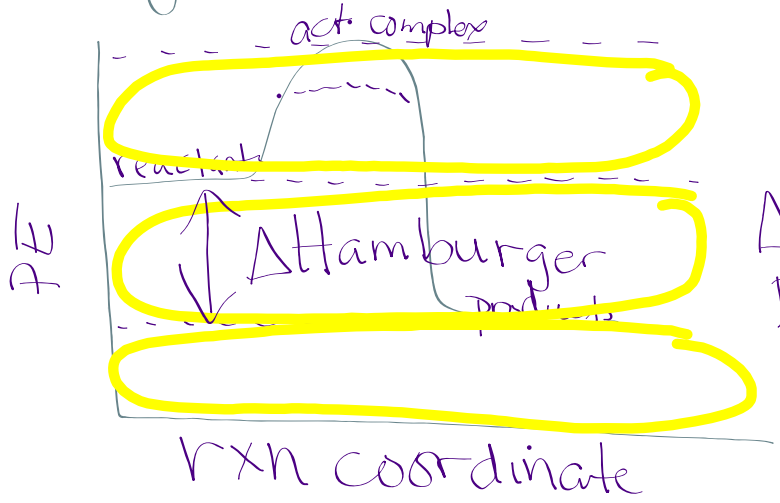
more dense = less volume
less space blw molecules

Table S

$$\%\text{error} = \frac{\text{difference}}{\text{accepted (table S)}} \times 100$$

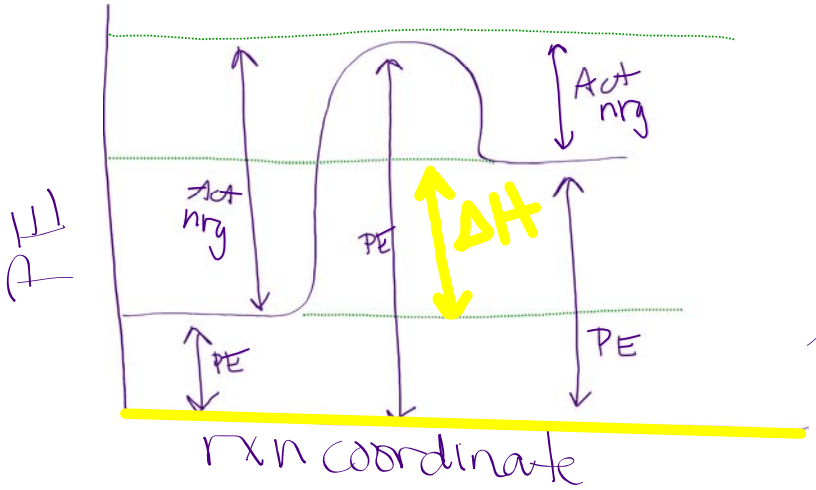

Heating Curve
endothermic
Temp
Solid
melting
liquid
vaporization
Gas
PE↑
Q=mcΔT
KE↑
PE↑
KE same
Q=mHf
KE↑
PE↑
Q=mHv
KE↑
(more heat needed)
Time (heat added

PE Diagram



exothermic
$-\Delta H$

ΔH = heat of rxn
PE products − PE reactants



endo
$+\Delta H$

Nuclear rxns

↳ give off much more energy than chemical bc mass → energy