

Monday Sept 28th 2020
Thurs Sept 12

Bohr Models pg 125 Grade 9

atomic #
11

+ ← ion charge

Na

← symbol

Sodium

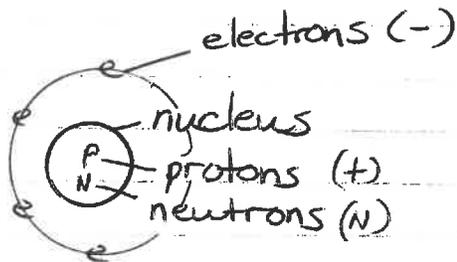
← name

23

Atomic mass

See periodic table

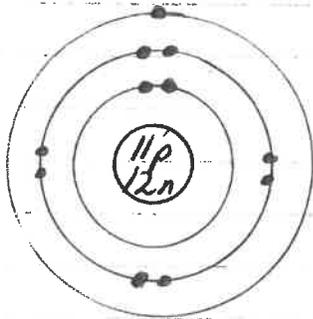
back of text book



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Grade 9

For a Bohr Model:

- 1) find number of protons $Na = 11$ protons
- 2) find number of neutrons $= 23 - 11 = 12$ neutrons
- 3) find number of electrons $= 11$ electrons

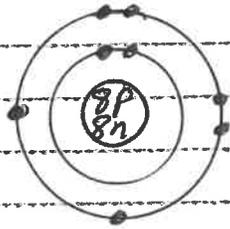


first (inner) shell → 2 electrons
2nd + third shell → 8 electrons max
outer shell is called the valence shell + valence electrons
all atoms want a full outer shell.

Assignment - 3 page worksheet

eg oxygen (O)

protons = 8
neutrons = $16 - 8 = 8$
electrons = 8



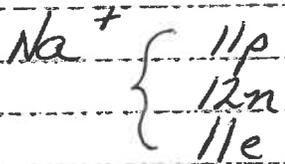
Atoms can become Ions

- Atoms want to have full valence shells to become stable
- use the ion charge to form ions

eg Ion of Sodium

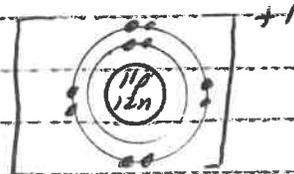
- if positive charge subtract electrons
- if negative charge add electrons

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Grade 9

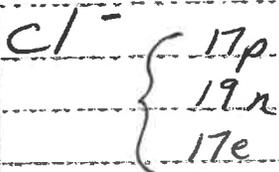


$$11e - 1e = 10e$$

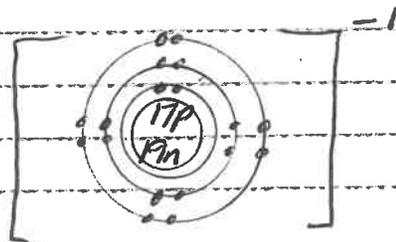
So the Ion Bohr model is:

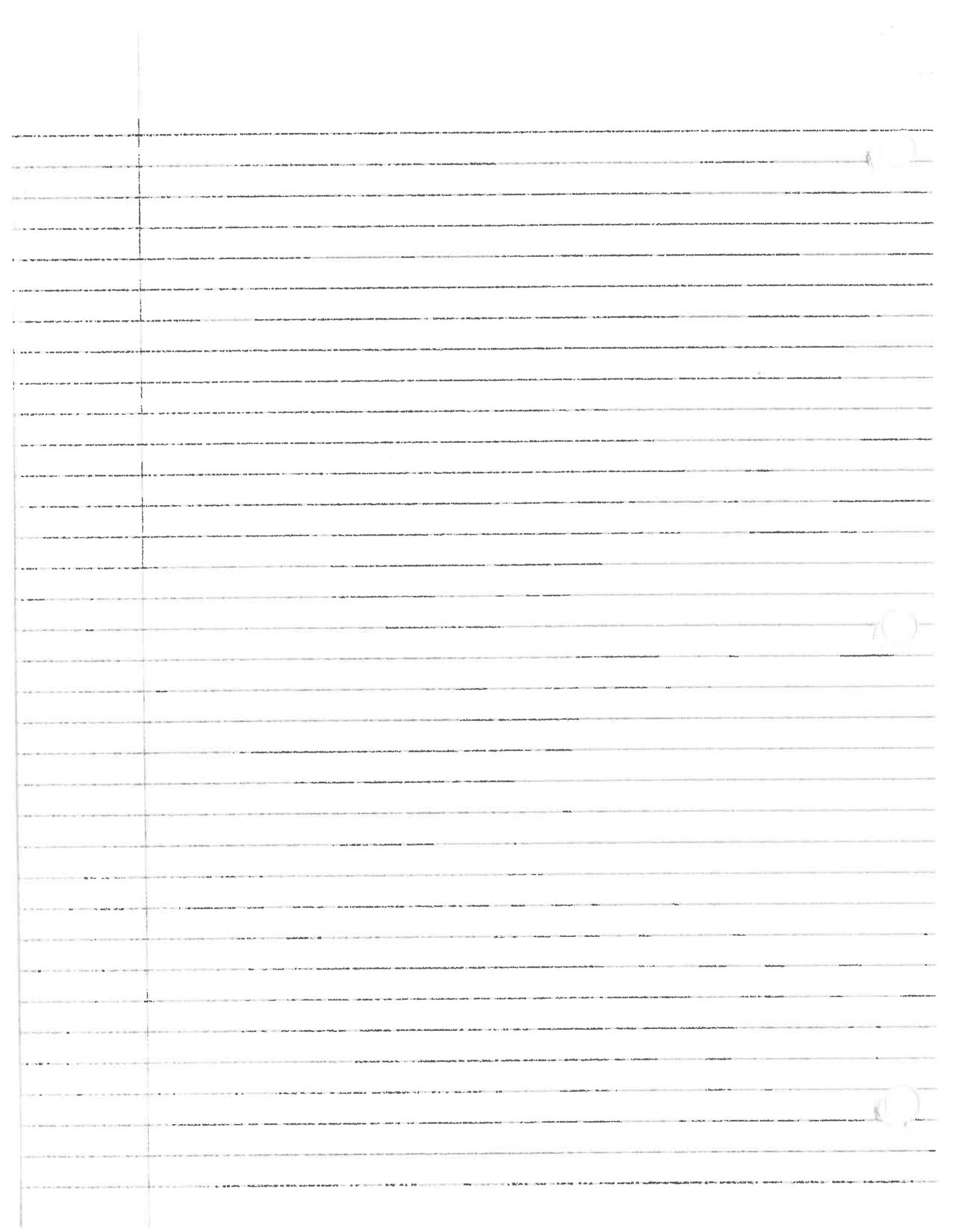


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Grade 10



$$17e + 1e = 18e$$





Oct 1 2020

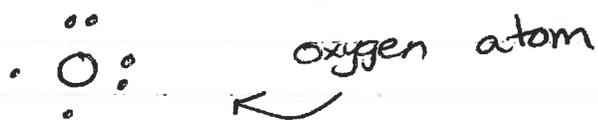
Lewis Diagrams

A simple way to "not" draw a Bohr model and only draw "valence" electrons.

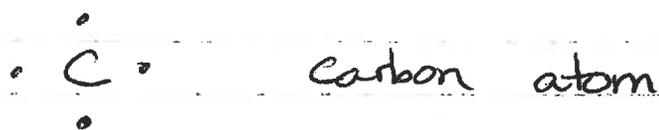
Do not draw circles. Dots represent electrons
Draw electrons in pairs but one at a time around element symbol

Do not include Protons or neutrons

Oxygen has 6 valence e^-



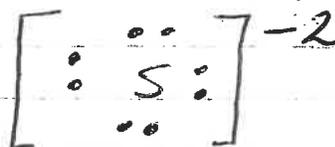
Carbon has 4 valence e^-



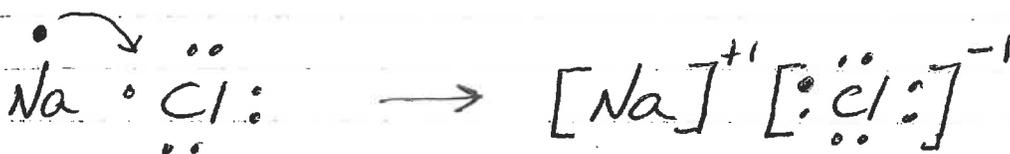
Sulfur atom



Sulfur ion



Ionic Compound - "metal and a nonmetal"
- electrostatic attraction



Covalent Bond - non metal and a non metal
- share electrons
- form "molecules"

ex: H₂O



ex: O₂



Monday Oct 5, 2020

Chemical Formula

Ionic = metal + non metal

example

Sodium + chlorine



→

Balance the charges
 NaCl
Sodium chloride

example

Sodium + Oxygen



→

Na_2O
Sodium Oxide

So we need two sodiums for one oxygen.

example

Magnesium + Sulfur



→

MgS

Magnesium Sulfide

balanced

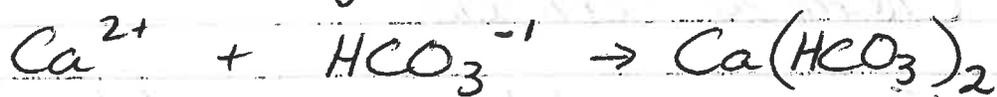
Polyatomic Ions

- these are not an element so you want find these on the periodic table, look at your polyatomic sheet !!
examples: NO_3 , CO_3 , PO_4 ...

metal (+) + polyatomic (-)

Do NOT change name !!

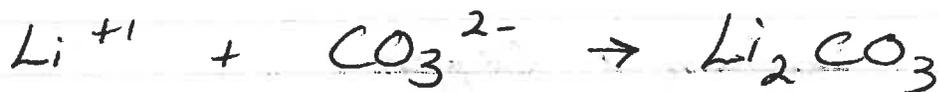
example Calcium + Hydrogen Carbonate



example Strontium + Nitrate



example Lithium + Carbonate



example Aluminium Sulfate



Multivalence Metal Ions

Metals with more than one charge
look at periodic table!!

example Fe $3+$, $2+$, Ti $4+$, $3+$

example Iron + Oxygen



So you need to use Roman numerals!
use after the metal name.

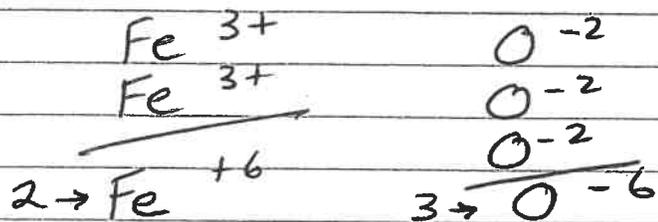
Iron II oxide

Monday Oct 5/20

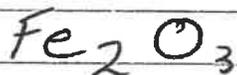
Think this way \circ



you need two Fe (iron) for every three O (oxygen)



So



Tuesday Oct 7/20

Covalent Compounds

- non metal + non metal

- do not look at charges

example CO, CO₂, N₂ ← two non metals

example in naming:

H₂O → dihydrogen monooxide

H₂O₂ → dihydrogen dioxide

S₂Br₄ → disulfur tetrabromide

P₂O₅ → diphosphorus pentoxide

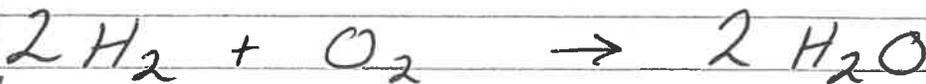
* NO₂ → nitrogen dioxide
↳ "NO mono" on 1st atom!

* PO₃ → Phosphorus trioxide
↳ NO mono

Wed. Oct 7/20

Balancing CHEMICAL EQUATIONS

REACTANTS \rightarrow PRODUCTS



Balanced

Number of Reactant atoms must = Number of Product atoms.

Word Equation:

Sodium and oxygen combine to form Sodium oxide

Skeleton Equation



Balance Equation



Diatomic

H_2

O_2

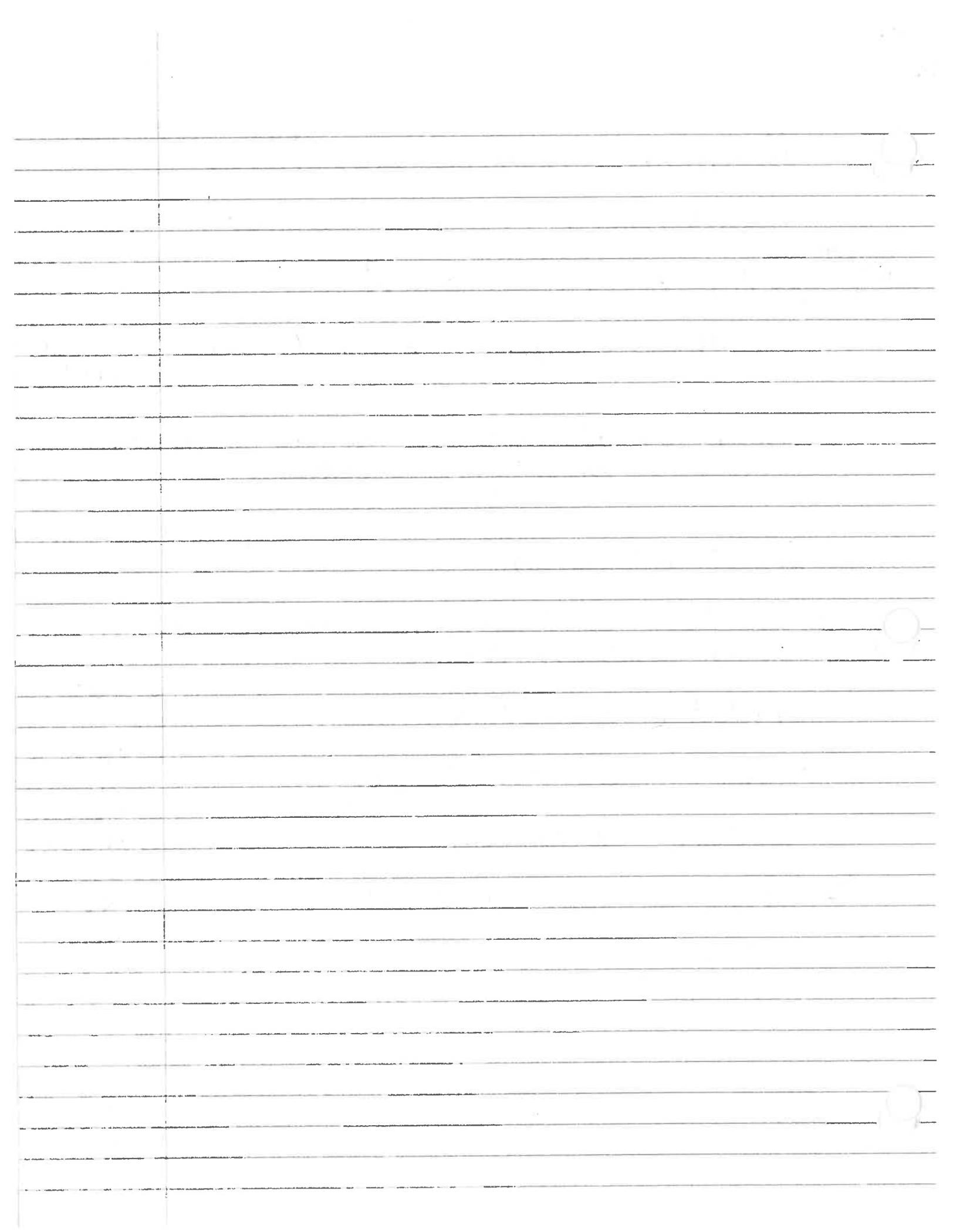
F_2

Br_2

I_2

N_2

Cl_2

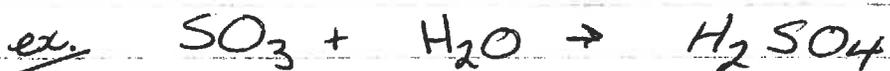


Monday Oct 13/20

Types of Chemical Equations.

(1) Synthesis Reaction ↳ "to make"

pg 160



(2) Decomposition Reaction ↳ "breaking down"

pg 158



(3) Single Replacement Reaction

pg 160

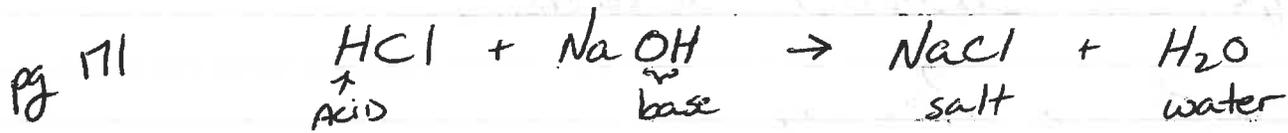


(4) Double Replacement Reaction

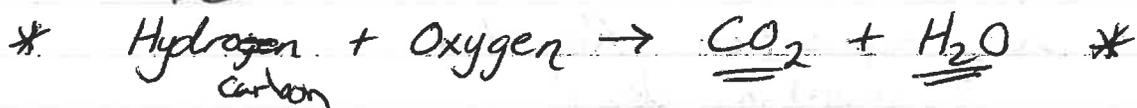
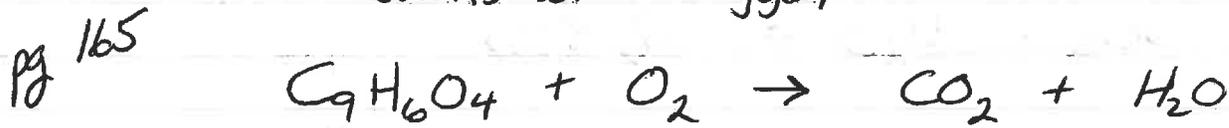
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(5) Acid-Base Neutralization:



(6) Combustion Reaction
↑ "burns with Oxygen"



Thursday Oct 15/20

Endothermic + Exothermic

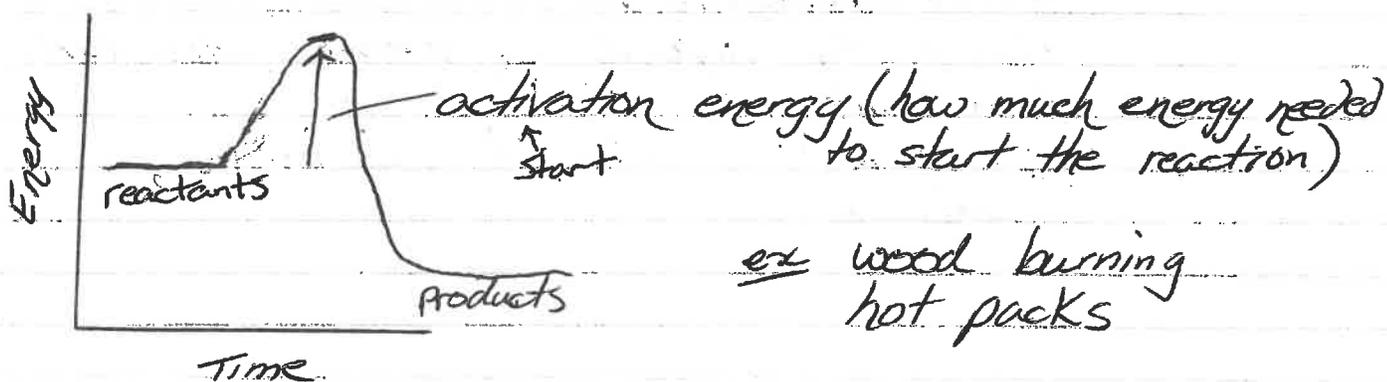
Heat is a measure of the "kinetic" energy of particles in a system and is therefore an indicator of the flow of energy in chemical reactions.

Since Energy cannot be created or destroyed, Energy must be conserved within a system.

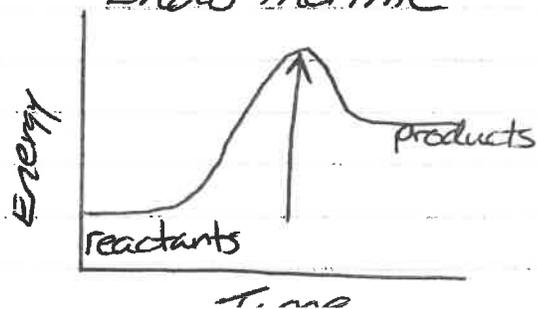
Emit energy into surrounding (Increased heat)
Exothermic "exo = out"

absorb energy from the surroundings (decreasing heat)
Endothermic "endo = inside"

Exothermic (reactants, higher energy than products)



Endothermic



Factors Affecting Reaction rate

Temperature

- increase heat, increase Rxn rate

Surface area

- increase surface area, increases Rxn rate
ex log vs Kindling ; Ice cub vs crushed ice.

Concentration

- higher concentration; increases Rxn rate
usually talking about solutions

Catalyst

- something that increases Rxn rate
but not consumed in the reaction
"Catalyst doesn't get used up"

Nature of reactants

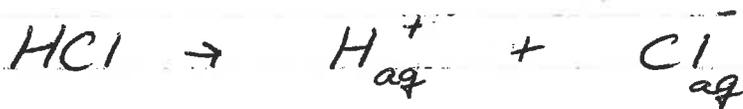
reactivity depends on atomic structure
of reactant
ex Mg in water vs Na in water
slow rxn fast rxn.

Friday Oct 16/20

ACIDS & BASES

pg 168 →

An acid is a substance that releases an H^+ ion (in a solution (aqueous or "aq")



Common Acids Pg 168

- HCl - Hydrochloric acid
- HF - hydrofluoric acid
- H₂SO₄ - sulfuric acid
- H₂CO₃ - carbonic acid
- HNO₃ - nitric acid
- CH₃COOH - acetic acid
 ↘
 H⁺

A base is a substance that reduces H^+ ions in solution &/or contributes a "hydroxide Ion: OH^- "



Common Bases pg 169

- NaOH - Sodium hydroxide
- Mg(OH)₂ - magnesium hydroxide
- Ca(OH)₂ - calcium hydroxide
- KOH - potassium hydroxide

pH scale

- numbers between 0 and 14 & indicates the acidity or basicity of a solution

1 - acidic , 14 basic

1 2 3 4 5 6 7 8 9 10 11 12 13 14

↑ neutral
(water)

Indicators

- chemicals that change colour in acids & bases (See data (page 3) booklet)

Common acids

stomach acid

lemons

grapes

tomatoes

Common bases

eggs

baking soda

soap

ammonia

Indicators tell us the pH of a substance and/or if its an acid or base

litmus paper

red = 0-7

blue = 7-14

See data pg 3 for indicators and their colours