

Kay

1. Fill in the table:

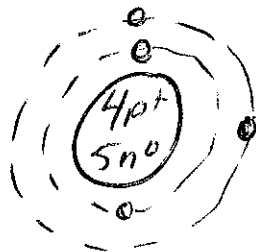
Group/family	Example of an element in the group	Number of valence electrons
Alkali metals	ex) Na	1
Halogens	F	7
Noble Gases	He	8 (or 2)
Alkaline Earth metals	Mg	2
Transition Metals	Cu	depends

2. Draw the lewis dot diagram for the following:

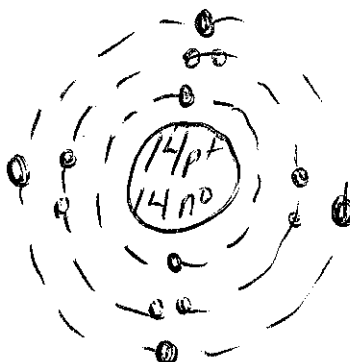
Element	Lewis dot	Element	Lewis Dot
Ca	Ca ⁰	Ne	Ne
Al	Al ⁰	C	C
S	S	K	K
Cl	Cl	N	N
He	He	Sb	Sb

3. draw a bohr diagram for the following:

a) Beryllium



b) Silicon



4. Fill in the table for the following atoms/ions:

Atom/ion	Atomic Number	Atomic Mass	# of Protons	# of electrons	# of Neutrons	Atom or ion?
Mg	12	24	12	12	12	A
P	15	31	15	15	16	A
F	9	19	9	9	10	A
Ar	18	40	18	18	22	A
Ca ²⁺	20	40	20	18	20	I
Al ³⁺	13	27	13	10	14	I
O ²⁻	8	16	8	18	8	I
N ³⁻	7	14	7	10	7	I

5. What is the difference between an atom and an ion?

Atoms have same #p⁺ & e⁻ (no charge)
 ions have gained/lost e⁻ (have a charge)

6. State 2 differences between ionic and covalent bonds.

ionic - transfer of e⁻, metal & non-metal
 covalent - sharing e⁻, 2 non-metals

7. Identify the following as ionic or covalent compounds:

Compound	Ionic or covalent	Compound	Ionic or covalent
CaCl ₂	I	S ₂ O ₃	C
CO	C	PbCl ₄	I
H ₂ O	C	CH ₄	C
NaCl	I	C ₂ H ₅ OH	C
Na ₂ O	I	NO ₃	C
LiF	I	S ₈	C
HBr	I	Fe ₂ O ₃	I

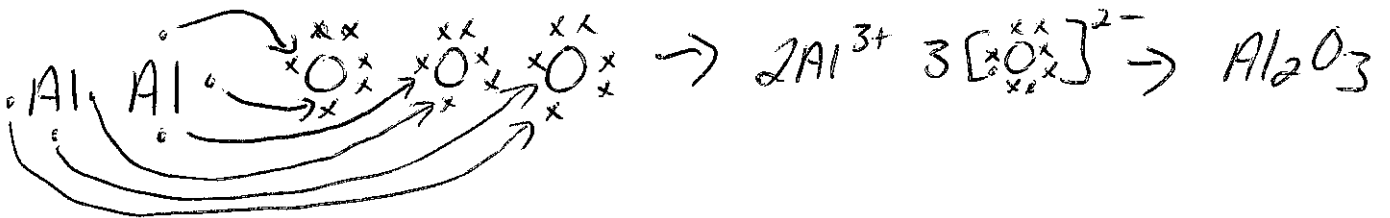
8. Metals lose (lose/gain) electrons to become + (positive/negative) ions. Non-metals gain (lose/gain) electrons to become - (positive/negative) ions.

9. Identify the following compounds as ionic or covalent, then draw a proper lewis dot diagram showing the bonding of each:

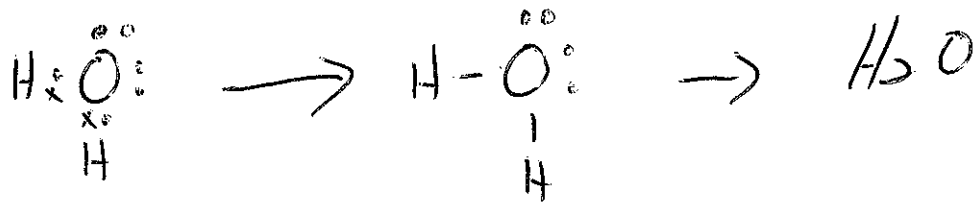
a) Ca + Cl Ionic



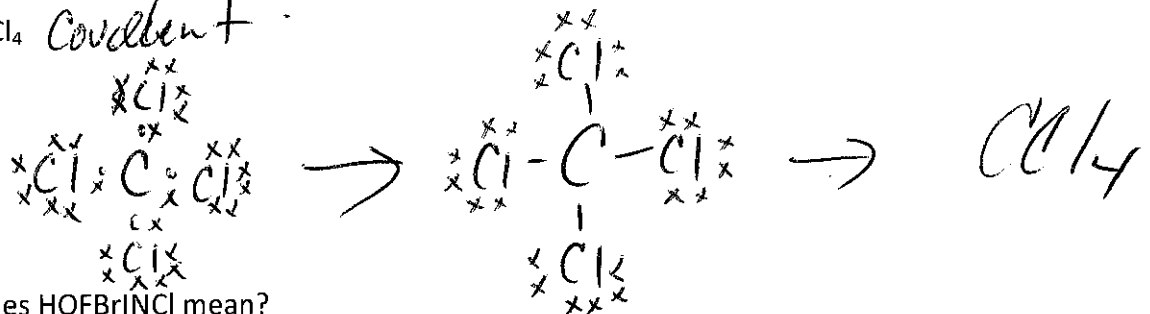
b) Al + O Ionic



c) H₂O Covalent



d) CCl₄ Covalent



10. What does HOFBrINCl mean?

↳ diatomic molecules (H₂, O₂, F₂, etc.)

11. Naming/Formula Writing

Binary Ionic

MgS

Magnesium Sulphide

KBr

Potassium Bromide

Ba₃N₂

Barium Nitride

Al₂O₃

Aluminium oxide

NaI

Sodium iodide

SrF₂

Strontium fluoride

Li₂S

Lithium Sulphide

RaCl₂

Radium Chloride

magnesium oxide

MgO

lithium bromide

LiBr

calcium nitride

Ca₃N₂

aluminum sulfide

Al₂S₃

potassium iodide

KI

strontium chloride

SrCl₂

sodium sulfide

Na₂S

radium bromide

RaBr₂

magnesium sulfide

MgS

Ionic With Transition Metals

CuS

Copper (II) Sulphide

PbBr₄

Lead (IV) Bromide

Pb₃N₂

Lead (II) Nitride

Fe₂O₃

Iron (III) oxide

FeI₂

Iron (II) iodide

Sn₃P₄

Tin (IV) Phosphide

Cu₂S

Copper (I) Sulphide

SnCl₂

Tin (II) Chloride

HgO

Mercury (II) oxide

CuCl₂

Copper (II) Chloride

copper(I) sulfide

Cu₂S

lead(IV) iodide

PbI₄

tin(II) fluoride

SnF₂

mercury(I) bromide

Hg₂Br

tin(II) oxide

SnO

chromium(III) oxide

Cr₂O₃

gold(I) iodide

AuI

Covalent

chlorine monoxide



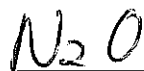
oxygen difluoride



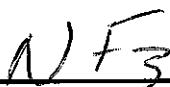
boron ^{trio}phosphide



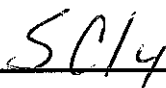
dinitrogen monoxide



nitrogen trifluoride



sulfur tetrachloride



carbon dioxide



diphosphorous
pentoxide



As₄O₆

tetraarsic hexoxide

BrO₃

Bromine trioxide

BN

Boron mononitride

N₂O₃

dinitrogen trioxide

NI₃

Nitrogen triiodide

SF₆

Sulfur hexafluoride

PCl₃

Phosphorus trichloride

CO

Carbon monoxide

PCl₅

Phosphorus pentachloride

12. State the law of conservation of mass.

matter can't be created/destroyed in a rxn

13. A student puts 2g of zinc in 10g of HCl acid. After the reaction takes place, the remaining solution weighs 9g. How many grams of gas were produced?

$2g + 10g = 12g \rightarrow$ prods must weigh 12g \therefore 3g of gas

14. What are reactants? Where are they found in a chemical reaction?

what is reacting - left side

15. What are products? Where are they found in a chemical reaction?

what is made \rightarrow right side

15. Balance the following reactions and state the type of reaction:

Reaction	Type
$2 \text{C}_4\text{H}_{10} + 13 \text{O}_2 \rightarrow 8 \text{CO}_2 + 10 \text{H}_2\text{O}$	C
$\text{MgF}_2 + \text{Li}_2\text{CO}_3 \rightarrow \text{MgCO}_3 + 2 \text{LiF}$	DR
$\text{N}_2 + 3 \text{H}_2 \rightarrow 2 \text{NH}_3$	S
$\text{CH}_4 + 2 \text{O}_2 \rightarrow \text{CO}_2 + 2 \text{H}_2\text{O}$	C
$2 \text{Al} + 6 \text{HCl} \rightarrow 3 \text{H}_2 + 2 \text{AlCl}_3$	SR
$2 \text{P}_2\text{O}_3 \rightarrow \text{P}_4 + 3 \text{O}_2$	D
$2 \text{NaF} + \text{Br}_2 \rightarrow 2 \text{NaBr} + \text{F}_2$	SR
$2 \text{Na}_3\text{PO}_4 + 3 \text{CaCl}_2 \rightarrow 6 \text{NaCl} + \text{Ca}_3(\text{PO}_4)_2$	DR
$\text{CF}_4 + 2 \text{Br}_2 \rightarrow \text{CBr}_4 + 2 \text{F}_2$	SR

16. From the following word equations, write the balanced reaction:

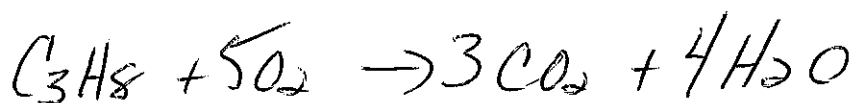
a) Hydrogen gas reacts with oxygen gas to produce water



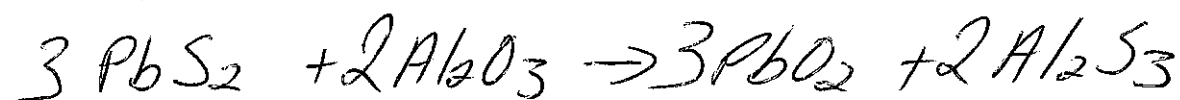
b) Iron(III) chloride reacts with oxygen gas to produce Iron(III) oxide and chlorine gas



c) Propane (C_3H_8) burns in oxygen to produce carbon dioxide and water.



d) Lead(IV) sulphide reacts with aluminum oxide to produce Lead(IV) oxide and aluminum sulphide



e) Potassium chlorate (KClO_3) breaks down into potassium chloride and oxygen gas when heated.



17. How do we test for the following gases?

a) Hydrogen

- lit splint \rightarrow "pops"

b) Oxygen

- glowing splint "relights"

c) Carbon dioxide

lit splint goes out.

18. Identify the following as acids, bases or neither:

a) H_2SO_4 A

b) HCl A

c) NaOH B

d) H_2O N

e) $\text{Mg}(\text{OH})_2$ B

19. List the properties of acids and bases:

Acids	Bases
Sour pH < 7 corrosive react w metals	Bitter pH > 7 caustic not reactive w metals

20. Complete the table of pH indicators:

Indicator	Colour in Acid	Colour in Base
Red litmus Paper	R	B
Blue Litmus Paper	R	B
Phenolphthalein	clear	pink

21. Given the following pH scale, identify where you would find acids, bases and neutral substances:



22. Identify the following as strong acids, weak acids, strong bases, weak bases, or neutral:

a) pH = 1 Strong Acid

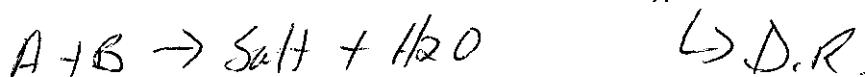
d) pH = 9 weak base

b) pH = 6 weak acid

e) pH = 13.5 strong base

c) pH = 7 neutral

23. What is a neutralization reaction? What other type of reaction could it be called?



24. What are the products of a neutralization reaction?



28. Write a balanced chemical equation showing a neutralization reaction.

