

Exam 1 Monday 19th September.

Chapters 1-2

Name → Formula.

ex: Copper(I) sulfate



Iron(III) carbonate



Ionic Compounds: Cations + Anions.

- often Metals + Non-metals.

ex: FeN, MgCl₂, AlF₃

Molecular/Covalent Compounds

- Often contain Non-Metals + Non-Metals.

ex: N₂O₅, N₂O, NO₂,

N₂O₄, NO

if we named these as ionic cpds, they'll all be called: **nitrogen oxide**.

Use Prefixes to indicate # of each element!

Prefix	^{uni} mono	^{bi} di	^{tri} tri	^{quad} tetra	penta
#	1	2	3	4	5

Prefix	hexa	hepta	octa	nona	deca
#	6	7	8	9	10

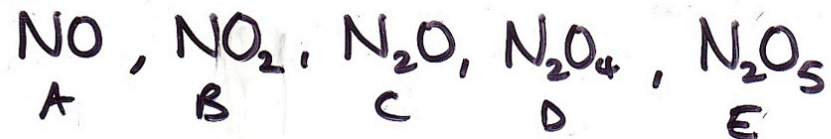
Name molecular compounds as if they are ionic (1st element = element name, 2nd element, ends in -ide)

- Use prefixes also.

Table 2.4

Greek Prefixes Used in Naming Molecular Compounds

Prefix	Meaning
mono-	1
di-	2
tri-	3
tetra-	4
penta-	5
hexa-	6
hepta-	7
octa-	8
nona-	9
deca-	10



Ⓐ ~~Mono~~ Nitrogen ~~Mono~~ Oxide

Ⓑ ~~Mono~~ Nitrogen Di Oxide

Ⓒ Di Nitrogen ~~Mono~~ Oxide

Ⓓ Di Nitrogen Tetra Oxide

Ⓔ Di Nitrogen Penta Oxide

● Do not use mono for 1st element!

● Sometimes we omit the last letter of prefix ...

ex: N_2Br_5
dinitrogen pentabromide

Cl_4P_9
tetrachlorine nonaphosphide

P_2O_5
diphosphorus pentoxide

P_4O_{10}
tetraphosphorus decoxide

SO_2
~~monosulfur~~ dioxide

How not to name...

N_3F_8
trinitrogen octafluoride

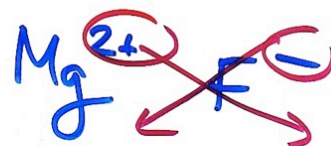
MgF_2 (Ionic! Metal + Non-metal)
- don't use prefixes!!!

magnesium difluoride

magnesium fluoride

ClO_2

~~chlorine~~ dioxide



MgF_2

Compound

Ionic

Cation: metal or NH_4^+
Anion: monatomic or polyatomic

Cation has only one charge

- Alkali metal cations
- Alkaline earth metal cations
- Ag^+ , Al^{3+} , Cd^{2+} , Zn^{2+}

Naming

- Name metal first
- If monatomic anion, add "-ide" to the root of the element name
- If polyatomic anion, use name of anion (see Table 2.3)

Cation has more than one charge

- Other metal cations

Naming

- Name metal first
- Specify charge of metal cation with Roman numeral in parentheses
- If monatomic anion, add "-ide" to the root of the element name
- If polyatomic anion, use name of anion (see Table 2.3)

Molecular

- Binary compounds of nonmetals

Naming

- Use prefixes for both elements present (Prefix "mono-" usually omitted for the first element)
- Add "-ide" to the root of the second element

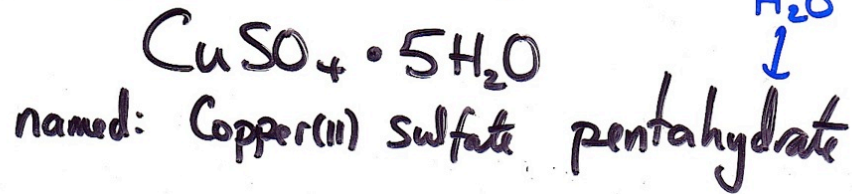
Common Acids

- HCl - Hydrochloric acid
 HNO_3 - Nitric acid
 H_2SO_4 - Sulfuric acid
 H_3PO_4 - Phosphoric acid

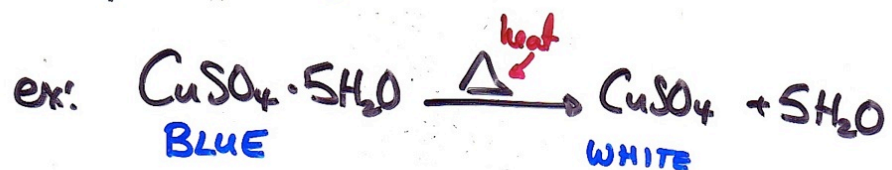
Hydrates

Compounds that have specific #s of H_2O molecules attached.

ex: Copper(II) sulfate has 5 molecules of H_2O attached for every one CuSO_4 .



Upon heating, we can drive off
some/all H_2O 's.



Anhydrous copper(II)
sulfate

Gypsum: $CaSO_4 \cdot 2H_2O$
calcium sulfate dihydrate



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Chapter 3 Stoichiometry

- Used to make predictions concerning how much "stuff" is made/used in a reaction!

Atomic Mass

Kg ~ too large when dealing with atoms/molecules/ions

Need a smaller unit of mass:

ATOMIC MASS UNIT (amu/u)

Defined as $\frac{1}{12}$ mass of a single atom of $^{12}_6\text{C}$.

