

Naming Polyatomic Ions and Acids

Oxyanions

- Oxyanions- negative ions containing oxygen.
- These have the suffix "-ate" or "-ite"
- "-ate" means it has more oxygen atoms bonded, "-ite" has less
- For example
- SO_4^{2-} sulfate
- SO_3^{2-} sulfite

Oxyanions

- Oxyanions may contain the prefix "hypo-", less than, or "per-", more than.
- For example
- ClO_4^- Perchlorate
- ClO_3^- Chlorate
- ClO_2^- Chlorite
- ClO^- Hypochlorite

Acids

- Certain compounds produce H^+ ions in water, these are called acids.
- You can recognize them because the neutral compound starts with "H".
- For example HCl, H_2SO_4 , and HNO_3 .
- Don't confuse a polyatomic ion with a neutral compound.
- HCO_3^- is hydrogen carbonate, not an acid.

Naming acids

- Does it contain oxygen?
- If it does **not**, it gets the prefix "hydro-" and the suffix "-ic acid"
- HCl
- Hydrochloric acid
- HF
- Hydrofluoric acid
- HCN
- Hydrocyanic acid

Naming Acids

- If it does contain an oxyanion, then replace the ending.
- If the ending was "-ate", add "-ic acid"
- If the ending was "-ite", add "-ous acid"
- H_2SO_4 Sulfuric Acid
- H_2SO_3 Sulfurous Acid

Examples

- HNO_3
- HI
- H_3AsO_4
- HClO_2

Examples

- HNO_3
- Nitric Acid
- HI
- Hydroiodic acid
- H_3AsO_4
- Arsenic Acid
- HClO_2
- Chlorous Acid

Nomenclature (naming) of Covalent compounds

Determining the type of bond

- First, determine if you have an ionic compound or a covalent compound.
- A **metal and a nonmetal** will form an **ionic bond**.
- Compounds with **Polyatomic ions** form **ionic bonds**.
- Nonmetals** bonding together or **Nonmetals and a metalloid** form **covalent bonds**.

Covalent bonding is very similar to ionic naming

- You always name the one that is least electronegative first (furthest from fluorine)
- Most electronegative last, and gets the suffix "-ide".

Covalent bonding is very different from ionic naming

- Ionic names ignored the subscript because there was only one possible ratio of elements.
- Covalent gives several possibilities so we have to indicate how many of each atom is present in the name

Prefixes you have to know

prefix	meaning	prefix	meaning
*mono-	1	hex-	6
di-	2	hept-	7
tri-	3	oct-	8
tetr-	4	non-	9
pent-	5	dec-	10

* the first atom named does not get the prefix "mono-", it just keeps its original name!

Examples

- CO
- CO₂
- NI₃
- P₄O₆

Examples

- CO
- carbon monoxide
- CO₂
- carbon dioxide
- NI₃
- nitrogen triiodide
- P₄O₆
- tetraphosphorus hexoxide

Continuing

- I₄O₉
- S₂F₁₀
- IF₇
- Si₂Cl₆

Continuing

- I₄O₉
- tetriiodine nonoxide
- S₂F₁₀
- disulfur decafluoride
- IF₇
- Iodine heptafluoride
- Si₂Cl₆
- disilicon hexachloride

Something to be wary of

- Many chemicals have "common names" because they have been in use for so long
- like H₂O₂
- following naming rules it is...
- dihydrogen dioxide
- commonly it is hydrogen peroxide.



Homework

- HW -go to <http://www.DHMO.org> and write a **2 paragraph** reaction to the site **citing actual information presented in the site**. Not just an angry rant, but an intelligent opinion.
- Pay attention to what you just learned!