MORE Rules for Polyatomic Ions

Pre…..-ate

-ate

-ite

Hypo …-ite

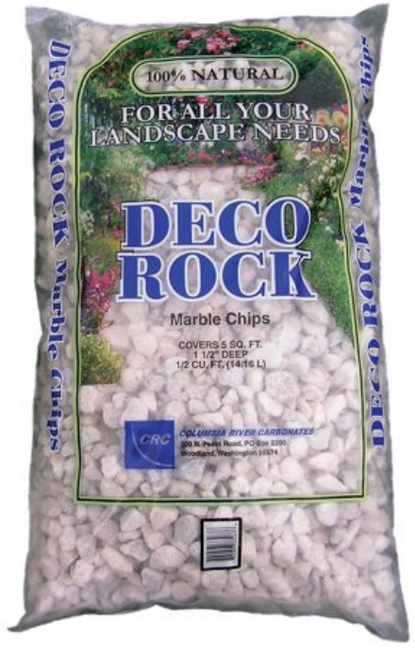
Bi-

Concentrate on learning, and becoming familiar with all of the **–ate** ions first (the ones containing large amounts of Oxygen or ‘oxyions’).

THESE HAVE SULFATES!

PHOSPHATES

Carbonates



Phosphate, Chlorate, Nitrate, Sulphate, Carbonate…

Once you know the **–ate** ions then follow these rules for the per-ate, ite, and hypo- ite etc…

Per… –ate Rule

Per… –ate ions have ONE MORE oxygen than the –ate ions.

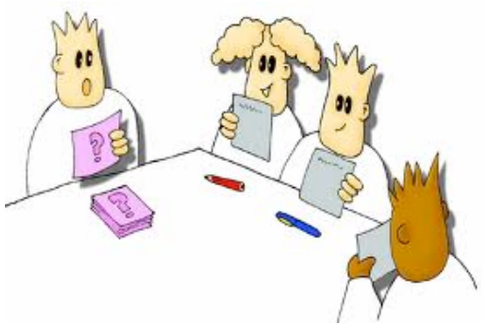
Sodium Chlorate $NaClO_3$

Sodium Perchlorate $NaClO_4$

Chlorate ion = ClO_3^- Perchlorate ion = ClO_4^-

**** NOTE THE CHARGE DOES NOT CHANGE

***the polyatomic ions containing a halogen base follow this rule



TRY THESE

Strontium Perbromate

Tin (IV) Perchlorate

-ite Rule

-ite ions have ONE LESS oxygen than the –ate ions.

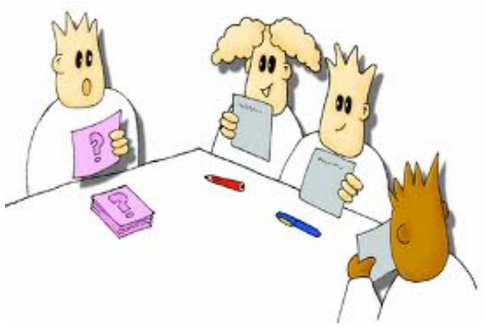
Sodium Chlorate $NaClO_3$

Sodium chlor**ite** $NaClO_2$

Chlorate ion = ClO_3^-

Chlor**ite** ion = ClO_2^-

**** NOTE THE CHARGE DOES NOT CHANGE



TRY THESE

Copper (II) Phosphite

Aluminum Sulphite

Hypo…-ite Rule

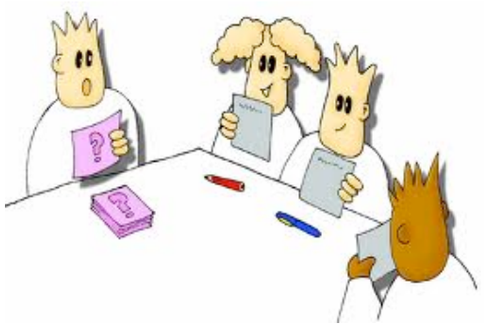
Hypo…-ite ions have TWO LESS oxygen than the –ate ions.

Sodium Chlorate $NaClO_3$

Sodium Hypochlor**ite** NaClO

Chlorate ion = ClO_3^- Hypochlor**ite** ion = ClO^-

**** NOTE THE CHARGE DOES NOT CHANGE



TRY THESE

Barium Hypobromite

Tungsten Hypochlorite

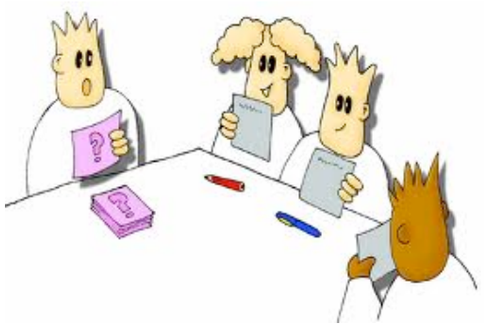
Bi… Rule

Bi… indicates the presence of **hydrogen.** This drops the charge by 1

carbonate	CO_3^{2-}
bicarbonate	HCO_3^{1-}
sulphate	SO_4^{2-}
bisulphate	HSO_4^{1-}
sulphite	SO_3^{2-}
bisulphite	HSO_3^{1-}

These are the only ones you will see

**** NOTE THE CHARGE DROPS by ONE from 2- to 1-



TRY THESE

Calcium Bicarbonate

Nickel (II) Bisulphate

Rule exception

Permanganate ion MnO_4^{1-}…though you might think, <u>there is no</u> manganate ion MnO_3^{1-}

That's why permanganate ion is on your chart.