IUPAC

- The International Unice of Pure and Applied Chemistry, IUPOC, has set rules for naming composited. page
- IUPAC set the rules for the naming and classification of inorganic compounds in 1940.
- These rules are still in use today.

Metals That Form Multiple Ions

- If a metal can form moesthan one cation (usually the **Transition Oletass**) it is named for the parent, followed by the sharge in <u>Roman numerals</u> in parentheses followed by the word "ion".
 - Fe²⁺ is the iron(II) ion
 - Fe³⁺ is the iron(III) ion
- This is called the *Stock system* of naming cations.



Remember: 5 Exceptions!!!

More Polyatomic Anions

- The formula for the chlorgal fon is ClO₃⁻. What is the formula for the chlorate chlorate fon?
 The suffix has changed from *-ate* to *-ite*. Chlorite must
 - The suffix has changed from *-ate* to *-ite*. Chlorite must have one less oxygen then chlorate, so its formula is ClO_2^{-} .
- Notice that the charge does not change as the number of oxygen atoms changes.
- There are three polyatomic ions that end in *-ide*:
 hydroxide, OH⁻, cyanide, CN⁻, and peroxide, O₂²⁻

3 exceptions

Limitation of the Crossover Rule

The crossover rule will not always work if we forget to reduce the ratio of ations to anions when possible:
 Ex) Curtand O²page

Crossover rule gives Cu₂O₂ (wrong!)

We must reduce the ratio to CuO (correct!)

Ex) Sn^{4+} and O^{2-}

Crossover rule gives $Sn_{2}O_{4}$ (wrong!)

We must reduce the ratio to SnO₂ (correct!)

Writing Formulas of Binary Ionic Compounds Write the formula of the following binary ionic compounds given their constituent ions: 1. Li⁺ and Cl⁻

2. Sn⁴⁺ and I⁻

Determining Ionic Charge

- If an ionic compound contains a metal which can have more than the ionic charge, we must determine the define on the ion. The sum total charge of an ionic compound **must equal zero**.
- What is the charge on the iron ion in Fe_2O_3 ?



Naming Binary Molecular Compounds

- The first element in the compound is named first and the second olement has the suffix *-ide*.
 The number of atoms of each element must be
- indicated by Greek prefixes.

Table 7.4	Greek Prefixes for Binary Molecular Compounds			
Atoms	Prefix	Atoms	Prefix	
1	mono-	6	hexa-	
2	di-	7	hepta-	
3	tri-	8	octa-	
4	tetra-	9	nona-*	
5	penta-	10	deca-	_

*Although the Latin prefix nona- is commonly used, IUPAC prefers the Greek prefix ennea-.

An Exception

- There is one exception to the use of the Greek prefixes when training binary molecular compounds.
 If there is only one atom of the first element, the
- *mono-* is never used:
 - IF₆ is iodine hexafluoride (not *mono*iodine hexafluoride)

Naming Ionic Compounds - Latin For metals where two charges are possible there two ways to name them: from 65 of 72 1) Ronpare Nimepalge 65 of 72

• We add a roman numeral in brackets to indicate the charge of the metal. (Already covered this way)

Latin System:

- We add the following endings to their old (Latin) root names:
- "ous" ending for ion with the LOWER charge
- "ic" ending for ion with the **HIGHER** charge

Naming Ionic Compounds - Latin

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Name the following compared of the Naming system; on 72 Naming system; on 72 preview page 67 of 72 1.FeCl_{3= ferric chloride/ iron 3 chloride}

2.PbO= plumbous oxide/ lead 2 oxide

 $3.Cu_2SO_{3= cuprous sulfite/ copper sulfite}$

 $4.Sn(CO_3)_{2=stannic carbonate/tin 2 carbonate}$