Warm Up:

Using the electronegativity values on p. 177 classify the following as nonpolar, moderately polar, very polar, or ionic:

1. CO
2. HBr
3. PCl_3
4. NaI

Table 8.3

Electronegativity Differences and Bond Types

Electronegativity difference range	Most probable type of bond	Example
0.0–0.4	Nonpolar covalent	H—H (0.0)
0.4–1.0	Moderately polar covalent	$\overset{\delta+}{H}-\overset{\delta-}{Cl}$ (0.9)
1.0–2.0	Very polar covalent	$\overset{\delta+}{H}-\overset{\delta-}{F}$ (1.9)
≥ 2.0	Ionic	Na^+Cl^- (2.1)

Objectives:

TSWBAT:

Name chemical compounds containing transition metal ions using the Stock System.

This unit is all about

Naming Ions

Review:

Cations are postive ions formed when an atom loses electrons.

Groups 1A,2A, & 3A metals form cations. The charge is the same as the group number.

The name of the cation is the same as the original atom for these groups.

Anions:

Nonmetals tend to gain electrons.

For groups 5A, 6A, & 7A, the charge is 8-Group#.

The name of the anion ends in"-ide."

Stock System

System for naming compounds with transition metals.

Real life scenario:

You have two bottles of crystals. Both are "chromium bromide" but one is white crystalline while the other is black crystalline. They have different physical and chemical properties. If they have the same name why do they look so different?

Answer: 

The transition metals
[as well as Lead (Pb) and Tin (Sn)]
can form MORE THAN
ONE CATION. We need to take this
fact into account when we name compounds
with transition metals in them.

Some metal groups form only one ion, so naming those is straight forward.

Group 1A forms 1+

Group 2A forms 2+

Group 3A forms 3+

Group 3B always forms 3+

In the "stock system" used for transition metals and Pb and Sn, Roman Numerals are used to show the charge on a metal cation in a compound.

So, a 1+ charge gets a I.
a 2+ charge gets a II.
a 3+ charge gets a III and a
4+ charge gets a IV.
(5+ gets a V)

Look at your Stock System handout.

Points to note:

1. Pb/Sn
2. Hg^{1+} must form a "dimer"
3. Exceptions to the need for the Stock System: Ag^{1+}, Zn^{2+}, Cd^{2+}

Warm Up:

Using your Stock System sheets,
list which ions each element forms:

Cr

Ag

Co

Li

Objectives:
TSWBAT:

Name chemical compounds containing transition metal ions using the Stock System.

Do you have to memorize all the possible ions each transition metal forms? No.

BUT you will need to be aware that this happens so you can determine the charge on a transition metal and name the compound in which you find it.

How do we use the Stock System?

Here is an example: $FeCl_3$

To determine the charge on the Fe cation, look at the anion in this compound. What charge is on an anion of Cl always?