

Naming Ions and Their Compounds

Naming Cations

1. Groups 1, 2, Al, and a few transition elements, which only form 1 valence state, (e.g. Zn^{2+} , Cd^{2+} and Ag^+) form only one kind of ion. They simply have the word "ion" added after their name. e.g.

Na^+	sodium ion
Mg^{2+}	magnesium ion
Al^{3+}	aluminum ion

2. Transition metals (most) can have differing charges

New **Stock System** uses metal name with the valence shown as a Roman Numeral in parenthesis.

Old **Greek/Latin System** uses "ic" ending for the higher charge and "ous" ending for the lower charge. These just need to be memorized!

Fe^{2+}	iron(II) ion	ferrous ion
Fe^{3+}	iron(III)ion	ferric ion
Sn^{2+}	tin(II) ion	stannous ion
Sn^{4+}	tin(IV)ion	stannic ion

3. Polyatomic cations (only 2 common ones)

NH_4^+	ammonium ion	
Hg_2^{2+}	mercury (I) ion	mercurous ion

Naming Anions

1. **Monatomic anions** have the suffix "ide added to the stem of the non-metal's name

i.e., chloride (Cl^-), sulfide (S^{2-}), bromide (Br^-), oxide (O^{2-}), etc.

Group 17 anions (of halogens) are called **halides**

2. Polyatomic anions most often contain oxygen and must be learned.

ate indicates the base number of oxygens (typically 3 but sulfate and phosphate have 4)

CO_3^{2-} , NO_3^- , PO_4^{3-} , SO_4^{2-} , ClO_3^- , BrO_3^- , IO_3^- , .
carbonate, nitrate, phosphate, sulfate, chlorate, bromate, iodate

These can form a series,

ClO_4^-	<u>perchlorate</u> ion	per means one more "O" than "ate"
ClO_3^-	<u>chlorate</u> ion	
ClO_2^-	<u>chlorite</u>	means one less "O" than "ate"
ClO^-	<u>hypochlorite</u>	hypo means one less "O" than "ite"