

Nomenclature (naming)

Metal Ions

- The name of the ion is the same as the metal (most of the time).
- Some metals don't follow the noble gas rule so you'll have to memorize the charges.
- Some metals can form more than one ion. When this is the case, roman numerals are used to indicate the charge.

Li^+ lithium ion	Be^{2+} beryllium ion	
Na^+ sodium ion	Mg^{2+} magnesium ion	Al^{3+} aluminum ion
K^+ potassium ion	Ca^{2+} calcium ion	
Ag^+ silver ion	Fe^{2+} iron (II) ion	Fe^{3+} iron (III) ion
	Pb^{2+} lead (II) ion	
	Cu^{2+} copper (II)	

Two non-metal cations to know

H^+ hydrogen	NH_4^+ ammonium
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Monatomic (one atom) Anions

- Change the suffix of the elements name to “-ide”.
- You should be able to use the noble gas rule to determine the charge on any non-metal anion.

C^{4-} carbide	N^{3-} nitride	O^{2-} oxide	F^- fluoride
Si^{4-} silicide	P^{3-} phosphide	S^{2-} sulfide	Cl^- chloride
			Br^- bromide
			I^- iodide

Polyatomic (many atom) Anions

OH^- hydroxide

- I don't believe that the rules explaining why the ions below have as many oxygen atoms as they do or why they have the charges they do is worth exploring in this class. I recommend that you simply memorize these.
- I have selected only a few of the many “oxo-anions” for you to memorize. Know (for future classes) that not all oxygen-containing anions have an “-ate” suffix.

BO_3^- borate	CO_3^{2-} carbonate	NO_3^- nitrate
PO_4^{3-} phosphate	SO_4^{2-} sulfate	ClO_3^- chlorate
CrO_4^{2-} chromate		

Naming Ionic Compounds

- It's easy! It's fun!
- Write the name of the cation followed by the name of the anion.

Some examples:

Ag_2SO_4 = silver sulfate $\text{Fe}(\text{OH})_2$ = iron (II) hydroxide FeN = iron (III) nitride

What to Know and When to Know It

- I can test your knowledge of nomenclature in almost any type of problem. It doesn't have to be its own "stand-alone" question.
- The following list gives examples of how I could test your knowledge of nomenclature. The list is ranked in order of increasing difficulty.

1) Know the name and/or formula of individual ions

examples: CO_3^{2-} is called _____
the formula of the chromate ion is _____

2) Know the name and/or formula of ionic compounds

examples: What is the formula of aluminum oxide?
 KClO_3 is called...?

3) Be able to write entire balanced chemical equations given the names of the reactants.

example: Write the net ionic equation for the reaction of sodium phosphate with copper (II) sulfide.

- You should be able to answer questions of type 1 (and maybe type 2) in time for Quiz #6.
- You should be able to answer questions of type 3 in time for Exam III (maybe in time for Quiz #7).