

## Ions to Know: Memorize these!!

### 1. Ions on the Periodic Table

Group 1:  $\text{Li}^{1+}$ ,  $\text{Na}^{1+}$ ,  $\text{K}^{1+}$ ,  $\text{Fr}^{1+}$  all have 1+ charge

Group 2:  $\text{Be}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Sr}^{2+}$ ,  $\text{Ba}^{2+}$  all have 2+ charge

Group 3:  $\text{B}^{3+}$ ,  $\text{Al}^{3+}$

Group 4:  $\text{C}^{4+}$ ,  $\text{C}^{4-}$

Group 5:  $\text{N}^{3-}$ ,  $\text{P}^{3-}$

Group 6:  $\text{O}^{2-}$ ,  $\text{S}^{2-}$

Group 7:  $\text{F}^{1-}$ ,  $\text{Cl}^{1-}$ ,  $\text{Br}^{1-}$ ,  $\text{I}^{1-}$

+ ions are named using the element name and the word *ion*.

example: lithium ion, sodium ion

—ions are named by replacing *—ine* with *—ide*

example: chloride, fluoride

#### A. Rules:

1. Remember, metals are on the left. All metal ions have a positive charge. ex.  $\text{Me}^{+}$
2. Nonmetals are on the upper right and nearly always have a negative charge.

### 2. Transition Metals - use Roman numerals

The Roman numeral given with the element is equal to the charge.

ex. Chromium (II) is  $\text{Cr}^{2+}$

$\text{Cr}^{2+}$	$\text{Cu}^{1+}$	$\text{Fe}^{2+}$	$\text{Pb}^{2+}$	$\text{Ni}^{2+}$	$\text{Sn}^{2+}$	$\text{Co}^{2+}$	$\text{Mn}^{2+}$
$\text{Cr}^{3+}$	$\text{Cu}^{2+}$	$\text{Fe}^{3+}$	$\text{Pb}^{3+}$	$\text{Ni}^{3+}$	$\text{Sn}^{4+}$	$\text{Co}^{3+}$	$\text{Mn}^{3+}$

### 3. Other transition metals without Roman numerals: there are only TWO.

Just memorize them:

Silver  $\text{Ag}^{1+}$

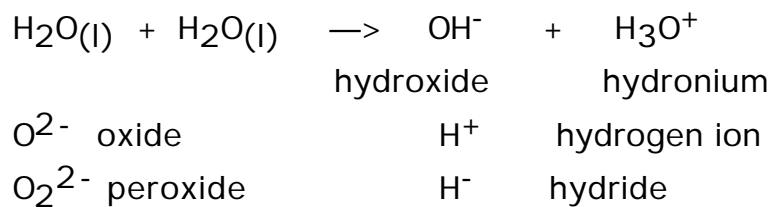
Zinc  $\text{Zn}^{2+}$

Mercury (I)  $\text{Hg}_2^{+2}$

Mercury (II)  $\text{Hg}^{+2}$

**Polyatomic Ions** (poly - many) so these are ions with more than one atom

**4. Ions related to Water**



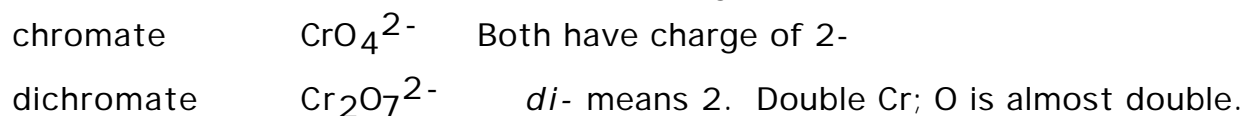
**5. Ions containing C, H, O**



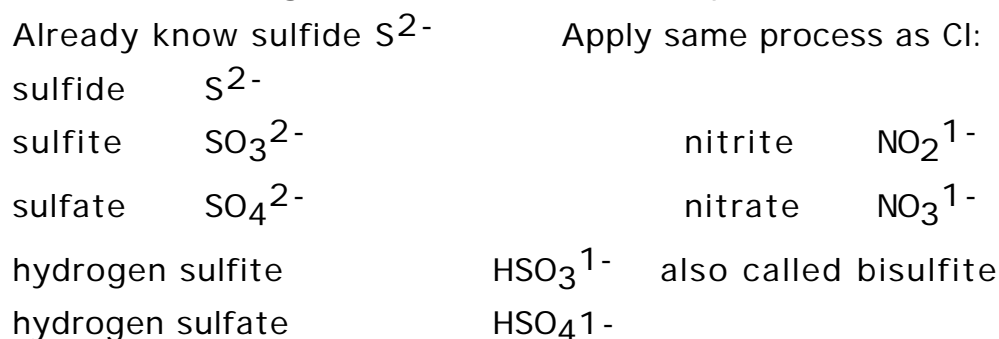
**6. Ions containing chlorine:**



**7. Chromium ions: (note: chromium is very toxic)**



**8. Sulfur and nitrogen ions:** used as food preservatives; some are carcinogens.



**9. Miscellaneous ions**

