

NOMENCLATURE WORKSHEET #3**Binary Ionic Compounds of Transition Metals**

To name binary ionic compounds of transition metals, we must specify the oxidation state of the metal by using a Roman numeral.

-1

Example:  $\text{SnCl}_4$  Tin (IV) chloride

$$x + 4(-1) = 0$$

$x = 4$ , so the oxidation is +4, which is (IV)

If we assign an oxidation number to the nonmetal anion (the negative ion), we can deduce the oxidation state of the metal cation. Since Cl is -1, Sn must be +4 in order for the net, or overall, charge to be zero.

It is not necessary to use Roman numerals for Ag (+1), Zn (+2), Cd (+2), or Ni (+2).

**Name the following compounds:**

1.  $\overset{+2}{\text{Sn}}\overset{-1}{\text{Cl}}_2$  tin(II) chloride
2.  $\overset{+2}{\text{Cu}}\overset{-2}{\text{O}}$  copper(II) oxide
3.  $\text{Fe}\overset{-2}{\text{S}}$  iron(II) sulfide
4.  $\text{Fe}_2\overset{-2}{\text{O}}_3$  iron(III) oxide
5.  $\text{Cu}_3\text{N}$  copper(I) nitride
6.  $\text{Pb}\overset{-2}{\text{O}}_2$  lead(IV) oxide
7.  $\text{PbS}$  lead(II) sulfide
8.  $\text{FeO}$  iron(II) oxide
9.  $\text{SnI}_2$  tin(II) iodide
10.  $\text{PbI}_4$  lead(IV) iodide
11.  $\text{Cu}_3\text{P}_2$  copper(II) phosphide
12.  $\text{FeBr}_3$  iron(III) bromide

+3 -3  
B N

Synth.  
diamond

13.  $\text{CuI}$  <sup>-1</sup> copper (I) iodide
14.  $\text{FeN}$  <sup>-3</sup> iron (III) nitride
15.  $\text{Pb}_3\text{N}_4$  lead (IV) nitride
16.  $\text{Fe}_2\text{S}_3$  iron (III) sulfide
17.  $\text{SnO}_2$  tin (IV) oxide
18.  $\text{PbCl}_2$  lead (II) chloride
19.  $\text{SnF}_2$  tin (II) fluoride
20.  $\text{ZnSe}$  zinc selenide
21.  $\text{Cs}_3\text{P}$  cesium phosphide
22.  $\text{CuS}$  copper (II) sulfide
23.  $\text{Be}_2\text{C}$  beryllium carbide
24.  $\text{CoCl}_2$  cobalt (II) chloride
25.  $\text{MnO}$  manganese (II) oxide
26.  $\text{HgO}$  mercury (II) oxide
27.  $\text{ZnS}$  zinc sulfide
28.  $\text{AgCl}$  silver chloride
29.  $\text{CdCl}_2$  cadmium chloride
30.  $\text{NiBr}_2$  nickel bromide
31.  $\text{CoCl}_3$  cobalt (III) chloride
32.  $\text{CrO}$  chromium (II) oxide
33.  $\text{Hg}_2\text{O}$  mercury (I) oxide
34.  $\text{Cr}_2\text{O}_3$  chromium (III) oxide
35.  $\text{Mn}_2\text{S}_3$  manganese (III) sulfide

oops  
not a  
transition  
metal →