

NOMENCLATURE WORKSHEET #2**Binary Ionic Compounds of Transition Metals**

Nomenclature worksheet #1 was easy because it contained only representative metals, i.e. Group IA, Group IIA, and Group IIIA. We know that these metals form +1, +2, and +3 ions, respectively. However, some metals can have more than one oxidation state. That is because they can form more than one type of ion. Many transition metals have this property, as well as tin and lead. These metals appear on the back of your "Polyatomic Ions to be Memorized" sheet.

With these metals, we must specify which oxidation state the metal has formed. We do this by the use of Roman numerals. This is important because more than one possible compound can exist for the same two elements.

Copper (I)	Cu^{+1}	Cobalt (II)	Co^{+2}	Chromium (II)	Cr^{+2}
Copper (II)	Cu^{+2}	Cobalt (III)	Co^{+3}	Chromium (III)	Cr^{+3}
Iron (II)	Fe^{+2}	Lead (II)	Pb^{+2}	Manganese (II)	Mn^{+2}
Iron (III)	Fe^{+3}	Lead (IV)	Pb^{+4}	Manganese (III)	Mn^{+3}
Tin (II)	Sn^{+2}	Mercury (I)	Hg_2^{+2}		
Tin (IV)	Sn^{+4}	Mercury (II)	Hg^{+2}		

There are some transition metals that always form the same ion, for example:

Silver	Ag^{+1}	Zinc	Zn^{+2}
Nickel	Ni^{+2}	Cadmium	Cd^{+2}

Let's look at the possible compounds which could form if copper and oxygen got together. If copper (I) formed a compound with oxygen, the formula would be:

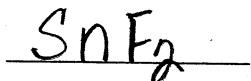
Step 1: CuO Step 2: $\text{Cu}^{+1} \text{O}^{-2}$ Step 3: Cu_2O

However, if copper (II) formed a compound with oxygen, the formula would be:

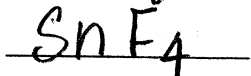
Step 1: CuO Step 2: $\text{Cu}^{+2} \text{O}^{-2}$ Step 3: CuO

Write formulas for the following:

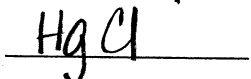
1. tin (II) fluoride



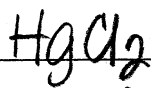
2. tin (IV) fluoride



3. mercury (I) chloride



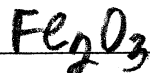
4. mercury (II) chloride



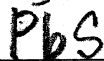
5. iron (II) oxide



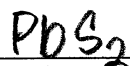
6. iron (III) oxide



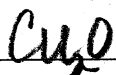
7. lead (II) sulfide



8. lead (IV) sulfide



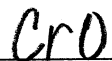
9. copper (I) oxide



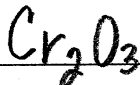
10. copper (II) oxide



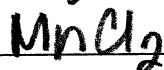
11. chromium (II) oxide



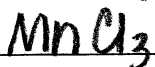
12. chromium (III) oxide



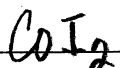
13. manganese (II) chloride



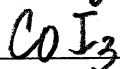
14. manganese (III) chloride



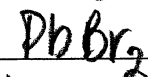
15. cobalt (II) iodide



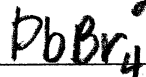
16. cobalt (III) iodide



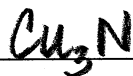
17. lead (II) bromide



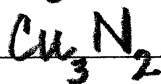
18. lead (IV) bromide



19. copper (I) nitride



20. copper (II) nitride



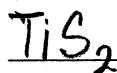
21. nickel chloride



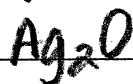
22. cadmium bromide



23. titanium (IV) sulfide



24. silver oxide



25. zinc chloride

