UNIT H Chemical Bonding
Day 3

Name KEYS

Formula Writing Sheet #1

**Use the criss-cross method to complete the chart by writing the correct formulas for the following compounds.**

| Name of Compound | Positive ion | Negative ion | Formula |
|---|---|---|---|
| 1. Sodium Iodide | $Na^+$ | $I^-$ | NaI |
| 2. Silver sulfide | $Ag^+$ | $S^{2-}$ | $Ag_2S$ |
| 3. Barium sulfate | $Ba^{2+}$ | $SO_4^{2-}$ | $BaSO_4$ |
| 4. Lithium sulfide | $Li^+$ | $S^{2-}$ | $Li_2S$ |
| 5. Sodium hydroxide | $Na^+$ | $OH^-$ | NaOH |
| 6. Ammonium chlorate | $NH_4^+$ | $ClO_3^-$ | $NH_4ClO_3$ |
| 7. Zinc sulfate | $Zn^{2+}$ | $SO_4^{2-}$ | $ZnSO_4$ |
| 8. Iron(III) phosphate | $Fe^{3+}$ | $PO_4^{3-}$ | $FePO_4$ |
| 9. Nickel (II) hydroxide | $Ni^{2+}$ | $OH^-$ | $Ni(OH)_2$ |
| 10. Chromium (III) oxide | $Cr^{3+}$ | $O^{2-}$ | $Cr_2O_3$ |
| 11. Iron (III) sulfate | $Fe^{3+}$ | $SO_4^{2-}$ | $Fe_2(SO_4)_3$ |
| 12. Copper (II) nitrate | $Cu^{2+}$ | $NO_3^-$ | $Cu(NO_3)_2$ |
| 13. copper (II) carbonate | $Cu^{2+}$ | $CO_3^{2-}$ | $CuCO_3$ |
| 14. magnesium phosphide | $Mg^{2+}$ | $P^{3-}$ | $Mg_3P_2$ |
| 15. aluminum nitrate | $Al^{3+}$ | $NO_3^-$ | $Al(NO_3)_3$ |
| 16. sodium phosphate | $Na^+$ | $PO_4^{3-}$ | $Na_3PO_4$ |
| 17. aluminum sulfate | $Al^{3+}$ | $SO_4^{2-}$ | $Al_2(SO_4)_3$ |
| 18. aluminum sufide | $Al^{3+}$ | $S^{2-}$ | $Al_2S_3$ |
| 19. iron (III) sulfite | $Fe^{3+}$ | $SO_3^{2-}$ | $Fe_2(SO_3)_3$ |
| 20. ammonium carbonate | $NH_4^+$ | $CO_3^{2-}$ | $(NH_4)_2CO_3$ |

Name _____ Formula Writing/Counting Atoms 2

Complete the chart. Remember these rules:

1. The number of atoms of each element (or polyatomic ions) is written in the space below the line and to the right of the symbol as a subscript.
2. When the number of atoms (or polyatomic ions) is one, the one is "understood" and you do not write anything.
3. The positive atom (or polyatomic ion) is written first in the formula.
4. Use (parentheses) only when necessary.

| Compound made of | Positive ion | Negative ion | Formula | Compound Name | Number of atoms in compound |
|---|---|---|---|---|---|
| 1. calcium and nitrate | $Ca^{2+}$ | $NO_3^-$ | $Ca(NO_3)_2$ | calcium nitrate | 9 |
| 2. tin (IV) and chloride | $Sn^{4+}$ | $Cl^-$ | $SnCl_4$ | tin(IV)chloride | 5 |
| 3. copper (II) and carbonate | $Cu^{2+}$ | $CO_3^{2-}$ | $CuCO_3$ | copper(II)carbonate | 5 |
| 4. barium and bromide | $Ba^{2+}$ | $Br^-$ | $BaBr_2$ | barium bromide | 3 |
| 5. tin (II) and sulfite | $Sn^{2+}$ | $SO_3^{2-}$ | $SnSO_3$ | tin(II) sulfite | 5 |
| 6. Ammonium and Nitrate | $NH_4^+$ | $NO_3^-$ | $NH_4NO_3$ | ammonium nitrate | 9 |
| 7. Lithium and phosphorus | $Li^+$ | $P^{3-}$ | $Li_3P$ | lithium phosphide | 4 |
| 8. Sodium and Bicarbonate | $Na^+$ | $HCO_3^-$ | $NaHCO_3$ | sodium bicarbonate | 6 |
| 9. Lead (II) and Phosphate | $Pb^{2+}$ | $PO_4^{3-}$ | $Pb_3(PO_4)_2$ | lead(II) phosphate | 13 |
| 10. magnesium and hydroxide | $Mg^{2+}$ | $OH^-$ | $Mg(OH)_2$ | magnesium hydroxide | 5 |
| 11. silver and sulfide | $Ag^+$ | $S^{2-}$ | $Ag_2S$ | silver sulfide | 3 |
| 12. barium and acetate | $Ba^{2+}$ | $C_2H_3O_2^-$ | $Ba(C_2H_3O_2)_2$ | barium acetate | 15 |
| 13. fluorine and manganese (II) | $Mn^{2+}$ | $F^-$ | $MnF_2$ | manganese(II) fluoride | 3 |
| 14. Chromium (III) and nitrate | $Cr^{3+}$ | $NO_3^-$ | $Cr(NO_3)_3$ | chromium(III) nitrate | 13 |
| 15. sulfate and Iron (III) | $Fe^{3+}$ | $SO_4^{2-}$ | $Fe_2(SO_4)_3$ | iron(III) sulfate | 17 |

2+3+12

Name KEY _____ Date: _____ Period: ____

**Names & Formulas of Ionic Compounds WS #2**

| Positive ion | Negative ion | Formula | Compound Name |
|---|---|---|---|
| $Ca^{2+}$ | $NO_3^-$ | $Ca(NO_3)_2$ | calcium nitrate |
| $Sn^{4+}$ | $Cl^-$ | $SnCl_4$ | tin(IV) chloride |
| $Cu^{2+}$ | $CO_3^{2-}$ | $CuCO_3$ +2 -2 | Copper(II) carbonate |
| $Ba^{2+}$ | $C_2H_3O_2^-$ | $Ba(C_2H_3O_2)_2$ | barium acetate |
| $Sn^{2+}$ | $SO_3^{2-}$ | $SnSO_3$ | tin(II) sulfite |
| $NH_4^+$ | $NO_3^-$ | $NH_4NO_3$ | ammonium nitrate |
| $Li^+$ | $PO_4^{3-}$ | $Li_3PO_4$ | lithium phosphate |
| $Na^+$ | $HCO_3^-$ | $NaHCO_3$ | sodium bicarbonate |
| $Mg^{2+}$ | $OH^-$ | $Mg(OH)_2$ | magnesium hydroxide |
| $Ag^+$ (always +1) | $S^{2-}$ | $Ag_2S$ | silver sulfide |
| $K^+$ | $C_2H_3O_2^-$ | $KC_2H_3O_2$ | potassium acetate |
| $Pb^{4+}$ | $SO_4^{2-}$ | $Pb(SO_4)_2$ | lead(IV) sulfate |
| $Cr^{3+}$ | $NO_3^-$ | $Cr(NO_3)_3$ | chromium(III) nitrate |
| $Fe^{3+}$ | $SO_4^{2-}$ | $Fe_2(SO_4)_3$ | iron(III) sulfate |

**OVER→**

| Positive ion | Negative ion | Formula | Compound Name |
|---|---|---|---|
| $Ca^{2+}$ | $C_2H_3O_2^-$ | $Ca(C_2H_3O_2)_2$ | calcium acetate |
| $Ni^{2+}$ | $SO_4^{2-}$ | $NiSO_4$ | nickel(II) sulfate |
| $Cu^{2+}$ | $HCO_3^-$ | $Cu(HCO_3)_2$ | copper(II) bicarbonate |
| $Mg^{2+}$ | $Cl^-$ | $MgCl_2$ | magnesium chloride |
| $Sn^{2+}$ | $SO_4^{2-}$ | $SnSO_4$ | tin (II) sulfate |
| $NH_4^+$ | $PO_4^{3-}$ | $(NH_4)_3PO_4$ | ammonium phosphate |
| $Al^{3+}$ | $NO_3^-$ | $Al(NO_3)_3$ | aluminum nitrate |
| $Ca^{2+}$ | $SO_3^{2-}$ | $CaSO_3$ | calcium sulfite |
| $Fe^{3+}$ | $CO_3^{2-}$ | $Fe_2(CO_3)_3$ | iron(III) carbonate |
| $Ca^{2+}$ | $OH^-$ | $Ca(OH)_2$ | calcium hydroxide |
| $Zn^{2+}$ (always +2) | $SO_4^{2-}$ | $ZnSO_4$ | zinc sulfate |
| $Sr^{2+}$ | $CO_3^{2-}$ | $SrCO_3$ | strontium carbonate |
| $NH_4^+$ | $F^-$ | $NH_4F$ | ammonium fluoride |
| $Cr^{3+}$ | $O^{2-}$ | $Cr_2O_3$ | chromium oxide |
| $Fe^{2+}$ | $PO_4^{3-}$ | $Fe_3(PO_4)_2$ | iron(II) phosphate |

Name KEY Date: _____ Period: ____

**WS Names & Formulas WS #3**

| Compound made of | Positive ion | Negative ion | Formula | Compound Name |
|---|---|---|---|---|
| 1. calcium and hydroxide | $Ca^{2+}$ | $OH^-$ | $Ca(OH)_2$ | calcium hydroxide |
| 2. lithium and sulfate | $Li^+$ | $SO_4^{2-}$ | $Li_2SO_4$ | lithium sulfate |
| 3. calcium and carbonate | $Ca^{2+}$ | $CO_3^{2-}$ | $CaCO_3$ | calcium carbonate |
| 4. magnesium and acetate | $Mg^{2+}$ | $C_2H_3O_2^-$ | $Mg(C_2H_3O_2)_2$ | magnesium acetate |
| 5. ammonium + sulfate | $NH_4^+$ | $SO_4^{2-}$ | $(NH_4)_2SO_4$ | ammonium sulfate |
| 6. lead(II) and phosphate | $Pb^{2+}$ | $PO_4^{3-}$ | $Pb_3(PO_4)_2$ | lead (II) phosphate |
| 7. aluminum and nitrate | $Al^{3+}$ | $NO_3^-$ | $Al(NO_3)_3$ | aluminum nitrate |
| 8. calcium and carbonate | $Ca^{2+}$ | $CO_3^{2-}$ | $CaCO_3$ | calcium carbonate |
| 9. copper(II) and bicarbonate | $Cu^{2+}$ | $HCO_3^-$ | $Cu(HCO_3)_2$ | copper (II) carbonate |
| 10. sodium + hydroxide | $Na^+$ | $OH^-$ | $NaOH$ | sodium hydroxide |
| 11. tin(IV) and sulfate | $Sn^{4+}$ | $SO_4^{2-}$ | $Sn(SO_4)_2$ | tin (IV) sulfate |
| 12. strontium + nitrite | $Sr^{2+}$ | $NO_2^-$ | $Sr(NO_2)_2$ | strontium nitrite |
| 13. sulfite and ammonium | $NH_4^+$ | $SO_3^{2-}$ | $(NH_4)_2SO_3$ | ammonium sulfite |
| 14. iron(III) and phosphate | $Fe^{3+}$ | $PO_4^{3-}$ | $FePO_4$ | iron(III) phosphate |
| 15. manganese (IV) and nitrite | $Mn^{4+}$ | $NO_2^-$ | $Mn(NO_2)_4$ | manganese (IV) nitrite |

**Ionic Compounds Formula Writing and Nomenclature Practice**

| | Name of cation | Name of anion | Formula of cation | Formula of anion | Formula of compound | Name of compound |
|---|---|---|---|---|---|---|
| 1 | Calcium Ion | Chloride Ion | $Ca^{2+}$ | $Cl^{-}$ | $CaCl_2$ | calcium chloride |
| 2 | Iron (III) Ion | Phosphide Ion | $Fe^{3+}$ | $P^{3-}$ | FeP | iron (III) phosphide |
| 3 | sodium ion | sulfide ion | $Na^{+1}$ | $S^{-2}$ | $Na_2S$ | sodium sulfide |
| 4 | aluminum ion | bromide ion | $Al^{+3}$ | $Br^{-1}$ | $AlBr_3$ | aluminum bromide |
| 5 | lithium ion | sulfide ion | $Li^{+}$ | $S^{2-}$ | $Li_2S$ | Lithium Sulfide |
| 6 | platinum (IV) ion | oxide ion | $Pt^{4+}$ | $O^{2-}$ | $PtO_2$ | Platinum (IV) Oxide |
| 7 | calcium ion | nitrate ion | $Ca^{+2}$ | $NO_3^{-1}$ | $Ca(NO_3)_2$ | calcium nitrate |
| 8 | Magnesium Ion | Carbonate Ion | $Mg^{2+}$ | $CO_3^{2-}$ | $MgCO_3$ | magnesium carbonate |
| 9 | Mercury (II) ion | sulfide ion | $Hg^{2+}$ | $S^{2-}$ | HgS | mercury (II) sulfide |
| 10 | Thorium (IV) | phosphate | $Th^{4+}$ | $PO_4^{3-}$ | $Th_3(PO_4)_4$ | thorium (IV) phosphate |