**Ionic Bonding: Determining Chemical Formulas**

**Introduction**

Ionic bonds are formed when electron(s) are lost by an atom, and a different atom takes the electron(s). Atoms become ions when the electron transfer takes place. Positive ions, called cations, lack electrons. Negative ions, called anions, have extra electrons. The attraction between positives and negatives is called electrostatic attraction. Oppositely charged ions are attracted to each other, while like charged ions are repelled from one another. The number of electrons that are exchanged is the key to determine a chemical formula. In a compound, the number of positives must be equal to the number of negatives. Compounds do not have + or - signs in them. The + and - charges on the ions have been attracted to each other, and cancel each other out when an ionic compound is formed. If a + or - sign is written, this indicates that an ion exists, not a compound. In order to complete an ionic compound, you must equate the number of positives with the right number of negatives, and vice versa.

Polyatomic ions are covalently bonded groups of atoms that together form a single ion. Their charges do not change, and must be memorized. A list of some common polyatomic ions can be found in Appendix B.

**Procedure**

1. Color all cations blue and all anions red.

2. Cut out the ions. On a sheet of paper, make the following compounds by piecing the ions together. Glue them in place. Then, write the formula for the compound.

 1. Magnesium Chloride 6. Potassium Sulfide

 2. Aluminum Sulfate 7. Calcium Hydroxide

 3. Hydrogen Fluoride 8. Rubidium Iodide

 4. Gallium Nitrate 9. Copper (I) Oxide

 5. Lithium Chloride 10. Sodium Carbonate

3. Complete problems 11-40, write the formula without the aid of the cut and paste ions.

 11. Mercury (II) Chloride

 12. Iron (III) Chloride

 13. Hydrogen Iodide

 14. Aluminum Oxide

 15. Calcium Nitrate

 16. Sodium Cyanide

 17. Aluminum Bromide

 18. Iron (II) Sulfate

 19. Lithium Fluoride

 20. Silver Carbonate

 21. Barium Acetate

 22. Ammonium Nitrate

 23. Zinc Oxide

 24. Tin (IV) Oxide

 25. Sodium Arsenate

 26. Calcium Oxide

 27. Cadmium (II) Chloride

 28. Tin (II) Chloride

 29. Sodium Phosphate

 30. Potassium Chromate

 31. Iron (III) Nitrate

 32. Chromium (I) Iodide

 33. Radium Bromide

 34. Ammonium Phosphate

 35. Copper (I) Sulfate

 36. Ammonium Hydroxide

 37. Hydrogen Iodate

 38. Calcium Hypochlorite

 39. Sodium Oxalate

 40. Silver Chloride

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