

CHEMISTRY LAB: ELECTRON DOT DIAGRAMS FOR IONIC COMPOUNDS

Objectives

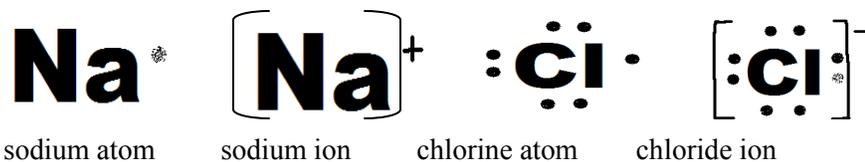
- To review element and ion names and symbols
- To practice writing electron dot diagrams for ionic compounds
- To relate electron dot diagrams to ion formation

Materials

- Colored pencils or markers
- Data Table
- Ruler
- Periodic Table

Procedure

- Follow the steps listed below to fill in the data table for the first 5 compounds, then on the back create a new data table for the remaining 5 compounds.
- In drawing the electron dot diagrams use one color for the cation and a different color for the anion.
- The steps to writing the electron dot diagram of a binary ionic compound:
 - (Columns 1 & 4) Write in the Name of the metal or nonmetal.
 - (Columns 3 and 6) Write the names of the ions. Remember that all monatomic anions end in -ide. Look up the oxidation numbers (charges) from their placement in the periodic table. Write the proper ion symbols and charges.
 - (Column 2) Draw the electron dot diagram for the cation. The cation will lose its electrons to the anion. If you use blue for sodium, its blue valence electron will be taken to form the chloride ion. The sodium ion has no valence electron showing. The complete octet in the cation is the exposed, previously filled shell from underneath the original valence. It is not shown in dot diagrams, to reflect the loss of electrons from the original valence "shell."
 - (Column 5) Draw the electron dot diagram for the anion. Use a different color than you used for the cation. The anion will gain electron(s) by taking it/them from the cation(s). The electrons that come from the cations should be shown in the color you used for the cation. All anions should show a complete octet.



- (Column 7) Draw the electron dot diagrams for the ions, alternating the positive and negative ions if possible. Check to make sure the charges add up to zero.
- (Column 8) Write the name of the binary ionic compound. Write the formula placing the cation on the left and the anion on the right. Include the correct subscript to indicate how many of each cation and anion are in the formula..

Ionic Compounds on front of data sheet	Ionic compounds on back of data sheet
1) lithium and oxygen	6) aluminum and sulfur
2) Magnesium and iodine	7) potassium and chlorine
3) Aluminum and fluorine	8) cesium and bromine
4) Calcium and nitrogen	9) sodium and phosphorus
5) Strontium and sulfur	10) lead and fluorine (lead has a +4 charge)

Questions

- Why do dot diagrams of cations show no electrons?
- How many electrons should the anions show in their dot diagrams?
- Why are all 10 of these compounds classified as "binary ionic" compounds?
- Why is it suggested to alternate the positive and negative ions in the compound dot diagram?
- Which element in each pair above would be the most electronegative?