

SECTION 2-3**REVIEW AND REINFORCE****Ionic Bonds****◆ Understanding Main Ideas**

Answer the following questions on a separate sheet of paper.

1. How does an atom become a positive ion? How does an atom become a negative ion?
2. How do ions form electrically neutral compounds?
3. What characteristics do solid ionic compounds share?
4. How does the electrical conductivity of ionic compounds change when they are melted or dissolved in water? Why is this so?

| Ions and Their Charges | | |
|------------------------|--------|--------------------|
| Name | Charge | Symbol/Formula |
| Ammonium | 1+ | NH_4^+ |
| Potassium | 1+ | K^+ |
| Calcium | 2+ | Ca^{2+} |
| Magnesium | 2+ | Mg^{2+} |
| Chloride | 1- | Cl^- |
| Oxide | 2- | O^{2-} |
| Sulfide | 2- | S^{2-} |
| Phosphate | 3- | PO_4^{3-} |

Use the chart above to answer the following on a separate sheet of paper.

5. How many potassium ions are needed to balance the charge of one sulfide ion? Explain.
6. Predict the formulas for calcium chloride and potassium phosphate.
7. Name the following compounds: MgS , NH_4Cl , and K_2O .
8. Which ions in the table are polyatomic ions?

◆ Building Vocabulary

Answer the following questions on a separate sheet of paper.

9. What is an ion?
10. What is an ionic bond?
11. What is the arrangement of ions in a crystal?

SECTION 2-3

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Pulling Away Electrons

You know that the metals in Group 1 and 2 are quite reactive. They combine easily with other elements to form compounds by losing electrons. Atoms from Group 1 lose one electron; atoms from Group 2 lose two electrons. It takes energy to remove an electron from an atom. Some atoms hold their electrons tighter than others do. Also, an individual atom holds some of its electrons tighter than others.

The size of an atom's radius affects how tightly its electrons are held. The larger the radius of an atom, the farther away from the nucleus some of its electrons are. The electron held the least tightly is easiest to remove. To remove yet another electron requires more energy than was needed to remove the first. The figure below compares the atomic radii of the Group 1 and 2 elements. The number underneath each element represents the atomic radius measured in picometers (pm).

Answer the following questions on a separate sheet of paper.

1. What do you notice about atomic radius as you move down a group? As you move across a period from Group 1 to Group 2?
2. Which element would you expect to be the most reactive in Group 1? In Group 2? Explain your answer.
3. In each period, which element of the pair would you expect to be more reactive? Explain your answer.
4. As you go across the periodic table, atomic radius continues to decrease. How does this fact help explain why the atoms of noble gases don't react easily with other atoms?

| | Group 1 | Group 2 |
|---|-----------|-----------|
| 2 | Li 152 | B 112 |
| 3 | Na 186 | Mg 160 |
| 4 | K 227 | Ca 197 |
| 5 | Rb 248 | Sr 215 |
| 6 | Cs 267 | Ba 222 |

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