

72 IONIC BONDS AND IONIC COMPOUNDS

Section Review

Objectives

- Explain the electrical charge of an ionic compound
- Describe three properties of ionic compounds

Vocabulary

- ionic compounds
- ionic bonds
- chemical formula
- formula unit
- coordination number

Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

- Anions and cations attract one another by means of 1. electrostatic forces.
- The forces of attraction that hold 2. oppositely charged ions together in ionic compounds are called 3. ionic bonds or electrostatic forces.
- Although they are composed of ions, ionic compounds are electrically 4. neutral.
- The lowest whole-number ratio of ions in an ionic compound is called a 5. formula unit.
- Nearly all ionic compounds are solid 6. crystals at room temperature. Ionic compounds in general have very 7. high melting temperatures. This is because the 8. strong or large attractive forces between the ions result in a very 9. stable rigid brittle structure.
- Ionic compounds conduct an electric current when in the 10. molten state or dissolved in water.

Part B True-False

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

- AT 11. During the formation of the compound NaCl, one electron is transferred from a sodium atom to a chlorine atom.

- SI 12. The coordination number of an ion is the number of ions that surround the ion in a crystal.
- AT 13. The coordination number of the ion Na^+ in NaCl is 6.
- SI 14. In forming an ionic compound, an atom of an element gains electrons.
- NT 15. Ionic compounds cannot conduct electricity if they are dissolved in water.

Part C Matching

Match each description in Column B to the correct term in Column A.

Column A

- B 16. ionic compounds
- E 17. ionic bonds
- C 18. chemical formula
- D 19. formula unit
- A 20. coordination number

Column B

- a. the number of ions of opposite charge surrounding each ion in a crystal
- b. compounds composed of cations and anions
- c. shows the kinds and numbers of atoms in the smallest representative unit of a substance
- d. lowest whole-number ratio of ions in an ionic compound
- e. the electrostatic forces of attraction binding oppositely charged ions together

Part D Questions and Problems

Answer the following in the space provided.

21. List the characteristics of an ionic bond.
- +2 Bond is caused by e-m forces
- +3 Strong
22. Explain the electrical conductivity of melted and of aqueous solutions of ionic compounds using the characteristics of ionic compounds.
- +3 When melted or dissolved the crystal structure breaks down: ions separate & are free to move. Cations then move to neg. electrodes & anions move to pos. electrodes. ∴ flow of electricity.

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