

1. The table below shows properties of two compounds at standard pressure.

**Selected Properties of Two Compounds**

Compound	Melting Point (°C)	Boiling Point (°C)	Electrical Conductivity
1	775	1935	good as a liquid or in an aqueous solution
2	-112.1	46	poor as a liquid

Which statement classifies the two compounds?

- 1) Both compounds are ionic.
  - 2) Both compounds are molecular.
  - 3) Compound 1 is ionic, and compound 2 is molecular.
  - 4) Compound 1 is molecular, and compound 2 is ionic.
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2. A solid sample of a compound and a liquid sample of the same compound are each tested for electrical conductivity. Which test conclusion indicates that the compound is ionic?
    - 1) Both the solid and the liquid are good conductors.
    - 2) Both the solid and the liquid are poor conductors.
    - 3) The solid is a good conductor, and the liquid is a poor conductor.
    - 4) The solid is a poor conductor, and the liquid is a good conductor.
  3. Which sample of matter has particles arranged in a crystalline structure?
    - 1) Ne(g)
    - 2) Br<sub>2</sub>(l)
    - 3) NaCl(aq)
    - 4) CuSO<sub>4</sub>(s)
  4. A hard substance that has a high melting point and is a poor conductor of electricity in the solid phase could be
    - 1) CO<sub>2</sub>
    - 2) Mg
    - 3) NaCl
    - 4) CCl<sub>4</sub>
  5. As 1 gram of sodium hydroxide dissolves in 100 grams of water, the conductivity of the solution
    - 1) decreases
    - 2) increases
    - 3) remains the same
  6. Which formula represents an ionic compound?
    - 1) KCl
    - 2) HCl
    - 3) CO<sub>2</sub>
    - 4) NO<sub>2</sub>
  7. Which type of bonds are formed when calcium atoms react with oxygen atoms?
    - 1) polar covalent
    - 2) coordinate covalent
    - 3) ionic
    - 4) hydrogen
  8. When metals combine with nonmetals, the metallic atoms tend to
    - 1) lose electrons and become positive ions
    - 2) lose electrons and become negative ions
    - 3) gain electrons and become positive ions
    - 4) gain electrons and become negative ions
  9. Sodium hydride and sodium chloride both have bonds which are predominantly
    - 1) metallic
    - 2) ionic
    - 3) covalent
    - 4) network
  10. When combining with nonmetallic atoms, metallic atoms generally will
    - 1) lose electrons and form negative ions
    - 2) lose electrons and form positive ions
    - 3) gain electrons and form negative ions
    - 4) gain electrons and form positive ions
  11. Which metal will form a compound with the general formula M<sub>2</sub>CO<sub>3</sub> when it combines with a carbonate ion?
    - 1) beryllium
    - 2) aluminum
    - 3) calcium
    - 4) lithium

## Practice Test

12. When a metal atom combines with a nonmetal atom, the nonmetal atom will
- 1) lose electrons and decrease in size
  - 2) lose electrons and increase in size
  - 3) gain electrons and decrease in size
  - 4) gain electrons and increase in size
13. Which formula is described correctly?
- 1)  $\text{BaCl}_2$  is covalent and molecular.
  - 2)  $\text{H}_2\text{O}_2$  is covalent and empirical.
  - 3)  $\text{H}_2\text{O}$  is ionic and molecular.
  - 4)  $\text{NaCl}$  is ionic and empirical.
14. Which formula correctly represents the compound calcium hydroxide?
- 1)  $\text{CaOH}$
  - 2)  $\text{Ca}_2\text{OH}$
  - 3)  $\text{CaOH}_2$
  - 4)  $\text{Ca}(\text{OH})_2$
15. Which is the formula for sodium perchlorate?
- 1)  $\text{NaClO}$
  - 2)  $\text{NaClO}_2$
  - 3)  $\text{NaClO}_3$
  - 4)  $\text{NaClO}_4$
16. Which is the formula of an ionic compound?
- 1)  $\text{SO}_2$
  - 2)  $\text{CO}_2$
  - 3)  $\text{CH}_3\text{OH}$
  - 4)  $\text{NaOH}$
17. Element  $X$  is in Group 2 and element  $Y$  is in Group 17. What happens when a compound is formed between these two atoms?
- 1)  $X$  loses electrons to  $Y$  to form an ionic bond.
  - 2)  $X$  loses electrons to  $Y$  to form a covalent bond.
  - 3)  $X$  gains electrons from  $Y$  to form an ionic bond.
  - 4)  $X$  gains electrons from  $Y$  to form a covalent bond.
18. Which atom will form an ionic bond with a Br atom?
- 1) N
  - 2) Li
  - 3) O
  - 4) C
19. Which kind of compound generally results when nonmetal atoms chemically combine with metal atoms?
- 1) network
  - 2) ionic
  - 3) molecular
  - 4) metallic
20. Which formula represents an ionic compound?
- 1)  $\text{H}_2$
  - 2)  $\text{CH}_4$
  - 3)  $\text{CH}_3\text{OH}$
  - 4)  $\text{NH}_4\text{Cl}$
21. An ionic compound consists of positive and negative ions each with 10 electrons. Half of these ions have a charge of  $1^+$  and the other half have a charge of  $1^-$ . What is the formula of this compound?
- 1)  $\text{KF}$
  - 2)  $\text{KCl}$
  - 3)  $\text{NaF}$
  - 4)  $\text{NaCl}$
22. Which compound contains *only* ionic bonds?
- 1)  $\text{HNO}_3$
  - 2)  $\text{NH}_4\text{Cl}$
  - 3)  $\text{H}_2\text{O}$
  - 4)  $\text{Na}_2\text{O}$
23. Which pair of elements below will form a compound with the greatest ionic character?
- 1) Pb and F
  - 2) Ca and O
  - 3) Na and Cl
  - 4) Cs and N
24. What is the correct Lewis electron-dot structure for the compound magnesium fluoride?
- 1)  $\text{Mg} \cdot \ddot{\text{F}} \cdot$
  - 2)  $\text{Mg}^+ \left[ \ddot{\text{F}} \right]^-$
  - 3)  $\left[ \ddot{\text{F}} \right]^- \text{Mg}^{2+} \left[ \ddot{\text{F}} \right]^-$
  - 4)  $\cdot \ddot{\text{F}} \cdot \text{Mg} \cdot \ddot{\text{F}} \cdot$
25. Draw the electron-dot (Lewis) structure of calcium chloride.

## Practice Test

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Base your answers to questions **26** and **27** on the information below.

A safe level of fluoride ions is added to many public drinking water supplies. Fluoride ions have been found to help prevent tooth decay. Another common source of fluoride ions is toothpaste. One of the fluoride compounds used in toothpaste is tin (II) fluoride.

A town located downstream from a chemical plant was concerned about fluoride ions from the plant leaking into its drinking water. According to the Environmental Protection Agency, the fluoride ion concentration in drinking water cannot exceed 4 ppm. The town hired a chemist to analyze its water. The chemist determined that a 175-gram sample of the town's water contains 0.000 250 grams of fluoride ions.

26. Draw a Lewis electron-dot diagram for a fluoride ion.

27. What is the chemical formula for tin (II) fluoride?

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28. Draw a Lewis electron-dot diagram for a chloride ion,  $\text{Cl}^-$ .

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## Answer Key Ionic Practice Test

1. 3

2. 4

3. 4

4. 3

5. 2

6. 1

7. 3

8. 1

9. 2

10. 2

11. 4

12. 4

13. 4

14. 4

15. 4

16. 4

17. 1

18. 2

19. 2

20. 4

21. 3

22. 4

23. 2

24. 3

25.

examples:



26.



27.  $\text{SnF}_2$

28.

