# Multiple choice questions for structure and bonding

***Education in Chemistry***April 2020
[rsc.li/3bbAO32](https://rsc.li/3bbAO32)

## Example multiple choice quizzes

This resource has five sets of multiple choice questions each written in the formats described by the accompanying article. They are written for the topic of structure and bonding for the age range 14-16.

**Set A:** positive questions

**Set B:** negative questions

**Set C:** Multiple completion questions

**Set D:** Best answer question

**Set E:** Assertion reason questions

These quizzes have also been prepared in the Socrative quizzing programme and can be downloaded into your own account using the following codes and links.

**Set A:** positive questions SOC-46393762

<https://b.socrative.com/teacher/#import-quiz/46393762>

**Set B:** negative questions SOC-46393774

<https://b.socrative.com/teacher/#import-quiz/46393774>

**Set C:** Multiple completion questions SOC-46393795

<https://b.socrative.com/teacher/#import-quiz/46393795>

**Set D:** Best answer questions SOC-46393809

<https://b.socrative.com/teacher/#import-quiz/46393809>

**Set E:** Assertion reason questions SOC-46393832

<https://b.socrative.com/teacher/#import-quiz/46393832>

## Set A: positive questions

Select the correct answer A–D.

1. How many covalent bonds does carbon form?
2. None, it does not form covalent bonds.
3. 2
4. 3
5. 4
6. The structure normally associated with ionic bonding is ...
7. a giant lattice.
8. a simple molecule.
9. a giant molecule.
10. a regular arrangement of ions surrounded by a sea, or cloud, of electrons.
11. All the substances listed are solids at room temperature. Which substance has a simple molecular structure?
12. Sodium
13. Iodine
14. Carbon (graphite)
15. Strontium
16. Magnesium is in group 2 in the periodic table. Which of the following formulas for magnesium compounds is correct?
17. MgO2
18. MgS2
19. MgF2
20. Mg2O
21. Why does sodium chloride not conduct electricity in its solid form?
22. Ions in its structure are in fixed positions.
23. It contains no free electrons.
24. It has a giant covalent molecular structure.
25. Ions in its structure only have single negative and single positive charges.
26. Which of the following statements explains why silicon dioxide has a high melting point?

A. It has a giant ionic structure with strong electrostatic attraction between ions.

B. It has a giant covalent structure with strong covalent bonds between atoms.

C. It has a simple molecular structure with weak forces between molecules.

D. It has a giant metallic structure with a strong attraction between positive ions and the sea of electrons.

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 **Set A answers** 1) D 2) A 3) B 4) C 5) A 6) B

## Set B: negative questions

1. Which of the following substances does not conduct electricity?
2. Brass
3. Copper
4. Carbon (graphite)
5. Carbon (diamond)
6. Which of the following does not contain ions that are free to move?
7. MgCl2(aq)
8. Mg(s)
9. MgCl2(l)
10. Mg(l)
11. Which of the following does not explain a substance displaying a high melting point?
12. Strong intermolecular forces between molecules.
13. Many strong covalent bonds.
14. Strong electrostatic attraction between oppositely charged ions.
15. Strong electrostatic attraction between positive ions and delocalised electrons.
16. Which of the following does not contain ionic bonds?
17. Sulfur dioxide
18. Sodium oxide
19. Silver oxide
20. Strontium oxide
21. Which of the following does not contain covalent bonds?
22. Carbon (graphite)
23. Carbon (diamond)
24. HCl (g)
25. NaCl (s)
26. Which of the following does not have a giant structure?
27. Diamond
28. Graphite
29. Iodine
30. Silicon dioxide

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**Set B answers** 1) D 2) B 3) A 4) A 5) D 6) C

## Set C: multiple completion questions

For the following questions, one or more of the options may be correct. Select your answer, A-D, using the following code.

|  |
| --- |
| Code |
| **A** | **B** | **C** | **D** |
| 1,2, and 3only correct | 1 and 3only correct | 2 and 4only correct | 4only correct |

1. Which of the following **does not** contain ionic bonds?
2. Sulfur dioxide
3. Sodium oxide
4. Silicon dioxide
5. Silver oxide
6. Which of the following is not a property of substances with ionic bonding?
7. High melting point
8. Crystallinity
9. Conduct electricity when molten
10. Conduct electricity in the solid state
11. Which of the substances has ions in its bonding model?
12. Copper
13. Carbon dioxide
14. Copper oxide
15. Carbon
16. Which of the substance has free electrons in its bonding model?
	1. Carbon (diamond)
	2. Carbon (graphite)
	3. Carbon dioxide
	4. Copper
17. Which of the following statements about water is not correct?
18. Water molecules contain covalent bonds.
19. Water has weak forces between molecules.
20. Water has a low melting point.
21. Water molecules contain H+ and OH- ions.
22. Which of the following phrases would be used in a description for the bonding in BOTH metals and ionic salts?
23. Strong electrostatic attraction
24. Ions
25. Giant lattice
26. Delocalised electrons

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**Set C answers** 1) B 2) D 3) B 4) C 5) D 6) A

## Set D: Best answer questions

1. Which of the following gives the best explanation for why a substance does not conduct electricity?
2. The bonding in the substance is not ionic.
3. The bonding model in the substance does not have free electrons.
4. The bonding model does not have ions which are free to move, or free electrons.
5. The bonding model does not have ions or free electrons.
6. Which of the following statements gives the best explanation for the fact that carbon forms 4 bonds?
7. Carbon is in group 4 of the periodic table
8. Carbon has 2 shells of electrons.
9. Carbon forms 4+ ions.
10. Carbon has 4 electrons in its outer shell.
11. Which of the following statements gives the best explanation for the high solubility of potassium bromide?
12. The ions are free to move.
13. There are positive and negative ions present in the substance.
14. The positive and negative ions are attracted to different regions of the polar water molecules.
15. Like dissolves like.
16. Which of the following covalent molecules is the best illustration of typical properties of substances with simple molecular covalent structures?
17. Water
18. Hydrogen
19. Iodine
20. Sulfur
21. Which of the following gives the best explanation for the fact that sodium chloride is crystalline?
22. There is strong electrostatic attraction between oppositely charged ions.
23. It contains a regular 3D arrangement of positive and negative ions.
24. The crystal contains ions.
25. There are free electrons present which reflect the light.
26. The picture shows an apparatus that a teacher used for demonstrating the properties of ionic substances. The teacher heats a sample of sodium chloride which contains two electrodes which are part of the circuit shown. The bulb does not light. What is the best explanation for this?
27. The circuit is not complete.
28. Sodium chloride does not conduct electricity.
29. The power pack wasn’t set up correctly.
30. The teacher did not heat the sample to the melting point of sodium chloride.

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**Set D answers** 1) C 2) D 3) C 4) B 5) B 6) D

**Set E: assertion reason questions**

For questions 1-5, use the following code

|  |  |
| --- | --- |
| **A** | Both statements are correct and the second statement is a correct explanation of the first. |
| **B** | Both statements are correct, but the second statement is not a correct explanation of the first. |
| **C** | Only statement 1 correct |
| **D** | Only statement 2 correct |
| **E** | Neither statement correct |

1. Statement 1: tap water does not conduct electricity.

Statement 2: tap water contains dissolved salts.

1. Statement 1: silicon dioxide is used for lining furnaces.

Statement 2: silicon dioxide has a high melting point.

1. Statement 1: sodium chloride has a high melting point.

Statement 2: ions are arranged in a regular lattice.

1. Statement 1: metals conduct electricity.

Statement 2: metal lattices contain layers of positive ions.

1. Statement 1: chlorine is a liquid at room temperature.

Statement 2: chlorine has simple molecular covalent bonding.

1. Statement 1: iodine is a solid at room temperature.

Statement 2: iodine is in group 7 of the periodic table.

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**Set E answers** 1) D 2) A 3) B 4) B 5) D 6) B