

How atoms share electrons in covalent bonds

Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · Test

Name: _____ Date: _____ Class: _____ Mark: ____ / 20

This test lasts 45 minutes and carries 20 marks. Answer every question. Show your working for calculations and use ideas about particles and forces when you explain properties. Keep to the number of marks given in brackets as a guide to the detail needed.

Level: Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · **Curriculum:** GCSE C2

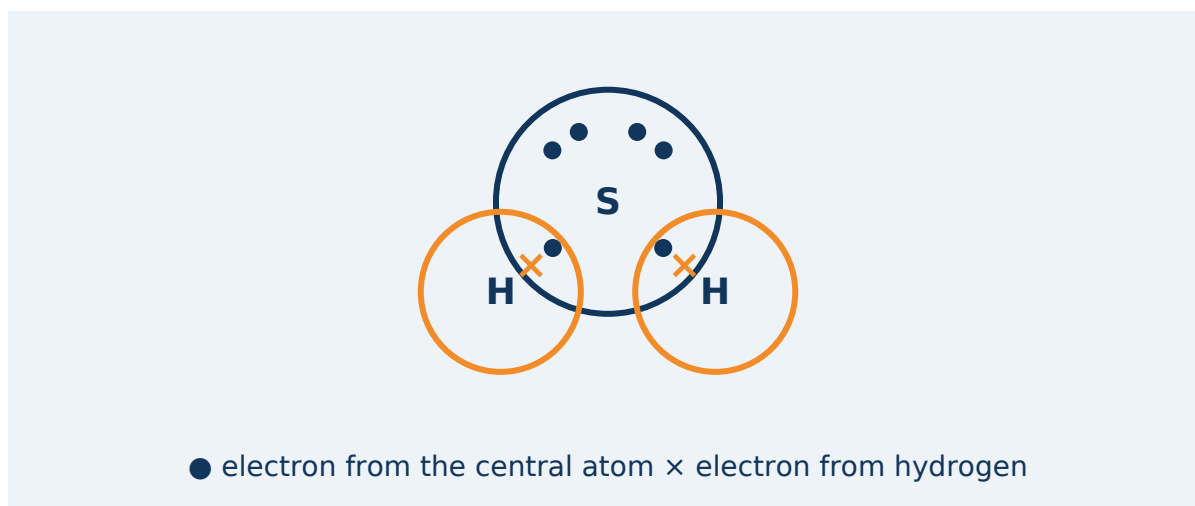
Time: 45 minutes · 8 questions · Total: 20 marks · Calculator allowed

Question 1 Define (2 marks)

- Define a covalent bond. (1 mark)
- Name one substance that contains covalent bonds. (1 mark)

Question 2 Hydrogen sulfide (3 marks)

The diagram shows hydrogen sulfide, H_2S . Sulfur has 6 outer electrons.



Hydrogen sulfide.

- State the number of shared pairs. (1 mark)
- State the number of lone pairs on sulfur. (1 mark)
- Explain why each sulfur atom bonds to two hydrogen atoms. (1 mark)

Question 3 Bonds in methane (3 marks)

A sample of methane, CH₄, contains 2.5×10^{21} molecules.

- State the number of covalent bonds in one molecule. (1 mark)
- Calculate the total number of covalent bonds in the sample. (2 marks)

Question 4 Diamond tools (2 marks)

Explain why diamond is used on the tips of drills. (2 marks)

Question 5 Graphite conducts (2 marks)

Explain why graphite conducts electricity. (2 marks)

Question 6 A mystery solid (2 marks)

A solid melts at 52 °C, is soft and does not conduct electricity. Classify it and justify your answer. (2 marks)

Question 7 Chlorine and iodine (3 marks)

Chlorine is a gas at room temperature but iodine is a solid. Explain the difference. (3 marks)

Question 8 Melting wax (3 marks)

Ravi writes: 'When wax melts, the covalent bonds break.' Evaluate his statement. (3 marks)