

Ions in a sea of electrons

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. Use the words ions, delocalised electrons and layers where they apply, and show the working for any calculation. The marks in brackets show how many points to make.

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

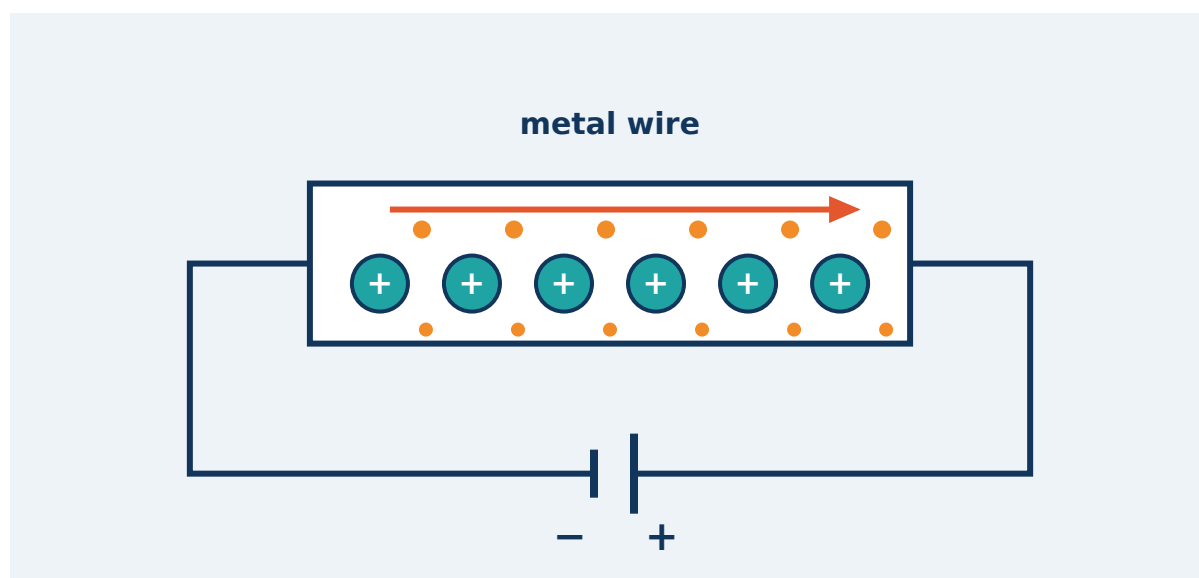
Time: 45 minutes · 8 questions · Total: 20 marks · Calculator allowed

Question 1 Metallic bond (2 marks)

Define a metallic bond. (2 marks)

Question 2 Electrons in a wire (3 marks)

The diagram shows a metal wire connected to a cell.



A metal wire connected to a cell.

- Name the particles that carry the current in the wire. (1 mark)
- State the direction in which they move. (1 mark)
- Explain why the positive ions do not carry the current. (1 mark)

Question 3 Why metals bend (3 marks)

Explain why a copper bar can be bent without snapping. (3 marks)

Question 4 Bronze statue (3 marks)

A bronze statue of mass 12.0 kg contains 88 % copper and the rest is tin.

- a. Calculate the mass of copper. (2 marks)
- b. Calculate the mass of tin. (1 mark)

Question 5 Steel and iron (3 marks)

Explain why steel is harder than pure iron. (3 marks)

Question 6 Sodium and magnesium (2 marks)

Explain why magnesium has a higher melting point than sodium. (2 marks)

Question 7 Conducting heat (2 marks)

Explain why a metal pan heats up quickly on a stove. (2 marks)

Question 8 Alloy or pure (2 marks)

Brass is harder than copper, but copper is a better electrical conductor. Explain both statements using particles. (2 marks)