

Shells, groups and the periodic table

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

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

This test covers electron arrangements, groups and periods, and the history of the periodic table. Show the electron count in each calculation, and write full sentences when a question asks you to explain.

Level: Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · **Curriculum:** HS-PS1-1, HS-PS1-2

Time: 45 minutes · 9 questions · Total: 20 marks · Calculator allowed

Question 1 Electron arrangements (3 marks)

Write the electron arrangement of each atom.

- Aluminium, atomic number 13 (1 mark)
- Sulfur, atomic number 16 (1 mark)
- Argon, atomic number 18 (1 mark)

Question 2 Group and period (2 marks)

An atom has the arrangement 2,8,8,2. State its group and its period. (2 marks)

Question 3 Mendeleev's table (3 marks)

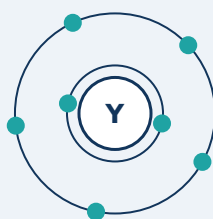
Describe how Mendeleev arranged the elements.

- State what order he used first. (1 mark)
- Explain why he left gaps. (1 mark)
- Give one piece of evidence that his table was correct. (1 mark)

Question 4 Atom Y (2 marks)

Atom Y is shown below.

- State its group. (1 mark)
- State its period. (1 mark)



Atom Y.

Question 5 Similar elements (2 marks)

Explain why lithium, sodium and potassium react in similar ways. (2 marks)

Question 6 Moseley's contribution (2 marks)

Explain how Moseley's work solved the problem of tellurium and iodine. (2 marks)

Question 7 Noble gases (2 marks)

Explain why neon is unreactive. (2 marks)

Question 8 Identify an element (2 marks)

An atom has three shells and six electrons in the outer shell. Calculate its atomic number and identify the element, given that atomic number 16 is sulfur. (2 marks)

Question 9 Losing or gaining (2 marks)

A magnesium atom is 2,8,2 and an oxygen atom is 2,6. State how many electrons each atom must lose or gain to get a full outer shell. (2 marks)