

**AQA, OCR, Edexcel**

**GCSE Science**

# **GCSE Chemistry**

The development of the model  
of the atom

**Answers**

Includes:

The development of the model of the atom



**Total Marks: /22**

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***The development of the model of the atom***

Q1: Why do scientific models change over time?

A= Scientific development with new experimental evidence may lead to a model being changed or replaced/ new evidence

(1 mark)

Q2: Following the discovery of the electron, the 'plum pudding model' was suggested, describe this model.

A= The atom is a ball of positive charge (1 mark) with negative electrons embedded in it (1 mark).

Accept:

- Electrons weren't known
- Atom looked like a plum pudding
- Positively charged mater spread through the atom
- Electrons buried in the atom
- Also accept a labelled diagram

(2 marks)

Q3: Ernest Rutherford tested this model, what was the name of this test and what did the results of Ernest Rutherford  $\alpha$  particle experiments show?

A= The alpha particle scattering experiment (1 mark)

A, Results= 1 mark for each of the following:

- Most  $\alpha$  particles pass straight though metal foil
- Number of  $\alpha$  particles deflected decreased as the angle of deflection increased

(2 marks)

Q4: What is the charge of an  $\alpha$  particle?

A= Positive/ +2

(1 mark)

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Q5: What conclusions did Rutherford deduce?

A= 1 mark for each of the following:

- Alpha particles smaller than atom
- Most of the atom is empty space
- Nucleus is positively charged
- Nucleus is where most of mass of atom is located

(3 marks)

Q6: What theory did Niels Bohr put forward?

A= Electrons orbit the nucleus

(1 mark)

Q7: How did Bohr show that electrons can move between orbits?

A= 1 mark for each of the following:

- Move closer to nucleus – Absorb electromagnetic radiation
- Move away from nucleus – Emit electromagnetic radiation

(2 marks)

Q8: Give a definition of a proton in relation to the nucleus and its charge.

A= Positive charge of a nucleus is divided into smaller particles (1).  
Each particle has the same amount of positive charge (1).

(2 marks)

Q9: Name the electromagnetic radiation emitted by electrons.

A= Photon

(1 mark)

Q10: Which scientist provided the evidence to support the nuclear model?

A= James Chadwick/ Chadwick

(1 mark)

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Q11: Discuss the theory of the nuclear model.

A= 1 mark for continuous prose and 5 of the following:

- Hydrogen least amount of charge
- All nuclei contain hydrogen nuclei
- Hydrogen nucleus named proton
- Mass of every nucleus except for hydrogen nucleus is bigger than the mass of it protons
- Must be uncharged particle in the nucleus too (neutron)
- Proton/ Neutron model explains all mass and charge

(6 marks)