FREE REVISION PACK

Alpha-Particle Scattering

Pearson Edexcel International Advanced Level Physics · Unit 4 (WPH14) · Specification points 112

Easy | Multiple choice · past-paper questions

5	5	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	What alpha scattering did not show	Edexcel IAL June 2024 · Unit 4 · Q7	1 mark
2	Easy	What Rutherford's experiment could not tell us	Edexcel IAL October 2023 · Unit 4 · Q5	1 mark
3	Easy	A valid conclusion from alpha scattering	Edexcel IAL October 2024 · Unit 4 · Q9	1 mark
4	Easy	An invalid conclusion from alpha scattering	Edexcel IAL January 2023 · Unit 4 · Q5	1 mark
5	Easy	Path of an alpha particle passing closer to a nucleus	Edexcel IAL January 2024 · Unit 4 · Q10	1 mark

Key ideas to have ready

- Most alpha particles pass straight through: most of the atom is empty space.
- A few are deflected through large angles: a tiny, dense, positively charged nucleus.
- The nucleus holds most of the mass but the electrons (negative charge) are outside it.
- The experiment says nothing about protons and neutrons inside the nucleus.

How to use this pack

1. The questions are grouped into levels (Easy). Work through them in order, and check your answers at the end of each level before moving on.
2. Every question is multiple choice with one correct answer. Write down your working anyway; that is how you find mistakes.
3. The separate mark scheme uses the same numbers and explains every answer.

Levels are based on how students did in Pearson's examiner reports where that information exists, plus our own difficulty rating. *About 1.5 minutes per question.

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Easy

Definitions and one-step ideas. Most students get these right.

Questions 1–5

Choose **one** answer for each question and put a cross in the box next to it.

Edexcel IAL June 2024 · Unit 4 · Q7

1 In the early 1900s, scientists carried out alpha particle scattering experiments.

Which of the following statements is **not** a valid conclusion from their observations?

☒ **A** Most of the atom is empty space.

☒ **B** The nucleus is made of neutrons and protons.

☒ **C** There is a concentration of charge in the atom.

☒ **D** There is a concentration of mass in the atom.

Edexcel IAL October 2023 · Unit 4 · Q5

2 Which of the following is **not** a valid conclusion from Rutherford's alpha particle scattering experiments?

☒ **A** The nucleus contains most of the mass of the atom.

☒ **B** The nucleus contains protons and neutrons.

☒ **C** The nucleus is charged.

☒ **D** The nucleus is very small compared with the atom.

Edexcel IAL October 2024 · Unit 4 · Q9

3 Scientists in the early twentieth century directed beams of alpha particles at thin metal foils.

Which of the following conclusions were they able to make from their observations?

☒ **A** All of the charge of the atom is concentrated in a small volume in the atom.

☒ **B** Most of the mass of the atom is concentrated in a small volume in the atom.

☒ **C** The electrons orbit the centre of the atom in specific energy levels.

☒ **D** There is a nucleus made of protons and neutrons.

Edexcel IAL January 2023 · Unit 4 · Q5

4 Which of the following statements is **not** a valid conclusion from alpha particle scattering experiments?

☒ **A** Most of the atom is empty space.

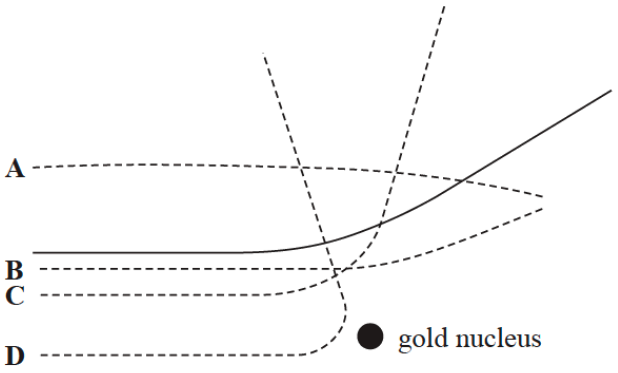
☒ **B** Most of the mass of the atom is concentrated in the nucleus.

☒ **C** The nucleus contains all of the charge of the atom.

☒ **D** The radius of the nucleus is very small compared to the radius of the atom.

Edexcel IAL January 2024 · Unit 4 · Q10

5 The solid line shows the path of an alpha particle as it passes close to a gold nucleus.



A second alpha particle with the same kinetic energy approaches the gold nucleus.

Which dotted line shows a possible path for the second alpha particle?

End of questions. Check your answers with the matching mark scheme. More free packs and 1-to-1 tuition:
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