

Models of the Atom

GCSE Physics · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Describe the plum pudding model of the atom. (2 marks)

Step 1 · Positive part

The atom is a ball (sphere) of positive charge.

Step 2 · Negative part

Negative electrons are embedded throughout it, like fruit in a pudding.

Answer: A ball of positive charge with electrons embedded in it

Check: There is no nucleus in this model.

2. Now try one with the steps

Give the three main observations of the alpha scattering experiment and the conclusion from each. (6 marks)

Step 1 · Most alpha particles went straight through

Step 2 · Some were deflected through small or large angles

Step 3 · A very few bounced back

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Describe the plum pudding model of the atom. [2]

2. Name the particle whose discovery led to the plum pudding model. [1]

3. In the alpha scattering experiment, state what happened to most of the alpha particles. [1]

4. State what the observation in question 3 tells us about the atom. [1]
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5. Explain why a few alpha particles bounced back from the gold foil. [2]
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6. Explain why alpha particles were deflected by the nucleus. [2]
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7. Compare the plum pudding model with the nuclear model. [3]
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8. Describe what Niels Bohr added to the nuclear model. [2]
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9. Name the scientist who provided evidence for the neutron and state roughly how many years after the nucleus became accepted this was. [2]
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10. Explain why scientists replaced the plum pudding model. [2]
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11. Suggest why Dalton's model of atoms spheres was accepted in the early 1800s. [1]
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12. Explain why the alpha scattering experiment was carried out in a vacuum. [1]
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13. Suggest why the gold foil had to be very thin. [1]
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14. Explain how a new scientific model becomes accepted. [2]
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4. Before you hand it in

"Most alpha particles bounced back."

Most went straight through; some were deflected; very few bounced back.

"Rutherford discovered the neutron."

Rutherford proposed the nucleus (1911); Chadwick provided evidence for neutrons (1932).

"The alpha particles were attracted to the nucleus."

They were repelled: like charges repel.

Saying the old model was 'wrong' so it was useless

Each model explained the evidence of its time; new evidence led to a better model.