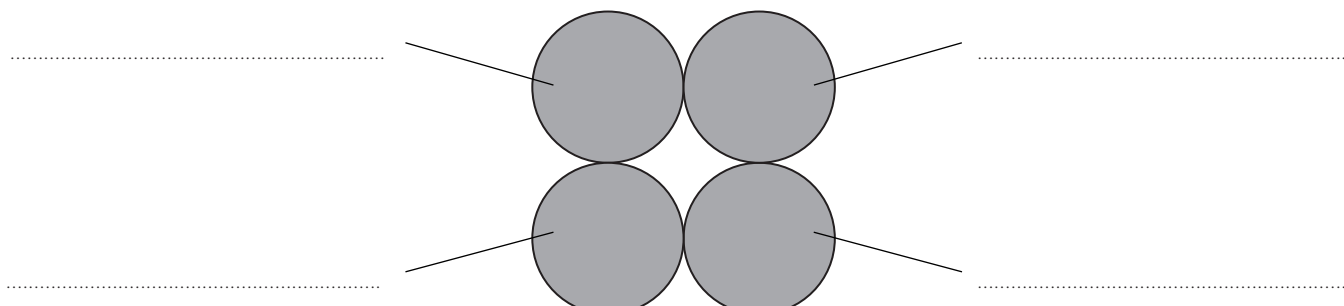


14 Two scientists, Geiger and Marsden, used alpha particles in a famous experiment.

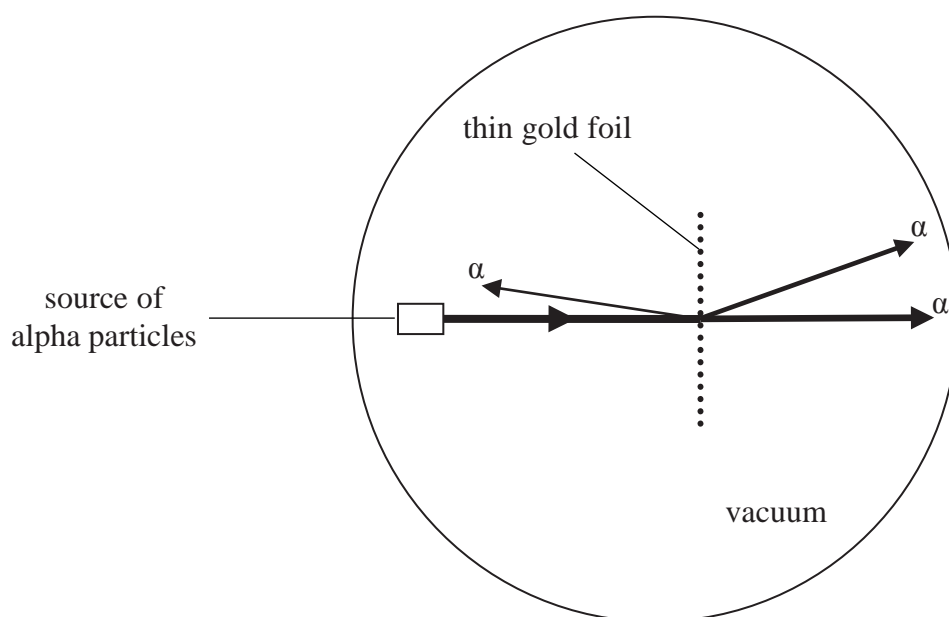
- (a) An alpha particle is formed from four smaller particles.
The diagram below represents an alpha particle.
Complete the labels to show the names of the four particles.

(2)



not to scale

- (b) The two scientists aimed alpha particles at a thin gold foil. Most of the alpha particles travelled straight through the thin gold foil.
Some of the alpha particles were deflected as shown in the diagram.



- (i) The scientists removed all the air from the apparatus.
Give **two** reasons why this was necessary.

(2)

1

.....

2

.....



(ii) Describe the force that caused some alpha particles to deflect.

(2)

(iii) The experiment showed that

- most of the alpha particles went straight through the foil
- some of the alpha particles were deflected through a small angle
- a few of the alpha particles were deflected back towards the source.

Scientists concluded that each gold atom has a small, dense, positively-charged nucleus.

Explain how the results of this experiment led the scientists to this conclusion.

(5)

(Total for Question 14 = 11 marks)

TOTAL FOR PAPER = 120 MARKS

