

Atomic structure – GCSE CS Physics1. **No.6****0 6**

A radioactive source emits alpha, beta and gamma radiation.

0 6 . 1

An alpha particle is the same as a helium nucleus.

How many times bigger is the radius of a helium atom than the radius of an alpha particle?

[1 mark]Tick (✓) **one** box.

Less than 100 times bigger

☐

Exactly 5000 times bigger

☐

More than 10 000 times bigger

☐**0 6 . 2**

Alpha particles can ionise atoms in the air.

What happens to an atom when it is ionised by an alpha particle?

[2 marks]Tick (✓) **two** boxes.

A neutron in the atom becomes a proton.

☐

The atom becomes a positive ion.

☐

The atom gains a neutron.

☐

The atom gains a proton.

☐

The atom loses an electron.

☐

0	6	.	3
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A spark detector is a device that can be used to detect alpha radiation.

A spark detector works by alpha particles ionising atoms in the air near a wire mesh.

A large potential difference creates a spark when the air near the wire mesh is ionised.

Suggest why a spark detector cannot detect beta radiation.

[1 mark]

Figure 11 shows the equipment the teacher has.

3 mm thick aluminium sheet

A thin sheet of paper

Radioactive source in a holder

Radiation detector

Count rate meter

[6 marks]

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

1. No.2

0 2

A radioactive source emits alpha, beta and gamma radiation.

0 2 . 1

An alpha particle is the same as a helium nucleus.

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[1 mark]

Tick (✓) **one** box.

Less than 100 times bigger

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Exactly 5000 times bigger

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0 2 . 2

Alpha particles can ionise atoms in the air.

What happens to an atom when it is ionised by an alpha particle?

[2 marks]

Tick (✓) **two** boxes.

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☐

The atom loses an electron.

☐

0	2	.	3
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A spark detector works by alpha particles ionising atoms in the air near a wire mesh.

A large potential difference creates a spark when the air near the wire mesh is ionised.

Suggest why a spark detector **cannot** detect beta radiation.

[1 mark]

Figure 3 shows the equipment the teacher has.

3 mm thick aluminium sheet

A thin sheet of paper

Radioactive source in a holder

Radiation detector

Count rate meter

[6 marks]

[illegible]