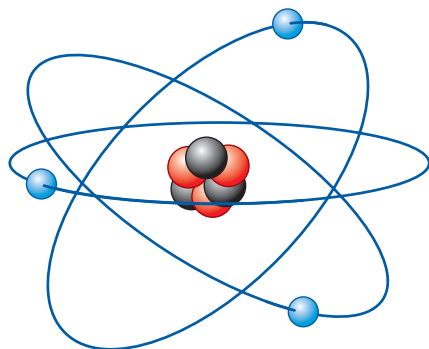


Self-assessment practice test questions Block 5

1 The diagram represents an atom.



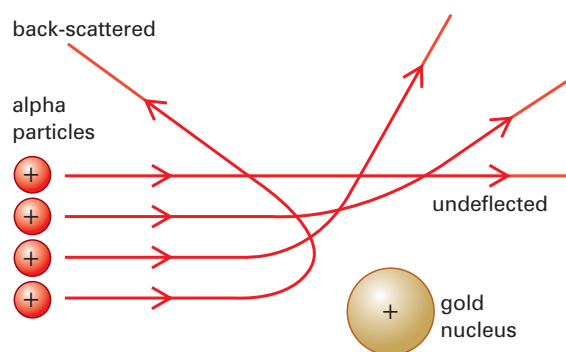
- a What name is given to the central part of the atom?
- b What particles make up this central part?
- c What particles orbit around the central part?
- d Which part of the atom has most of its mass?
- e Atoms are small. Roughly how many, placed in a line, would occupy one millimetre – a thousand, a million, a billion or a trillion?

2 The nucleus of an atom of nitrogen is represented by the symbol:



- a How many nucleons are there in this nucleus?
- b What is the proton number of this nucleus and what is its neutron number?
- c A different isotope of nitrogen has one fewer nucleon in its nucleus. Write the symbol for this nucleus.
- d How many electrons are there in a neutral atom of this second isotope?

- 3** The diagram shows what happens when alpha particles pass close to the nucleus of a gold atom.




- Explain why the path of an alpha particle may bend as it passes close to a gold nucleus.
 - Explain why one of the alpha particles is undeflected.
 - One alpha particle has been 'back-scattered'. Explain why this has happened.
- 4** We are all exposed to background radiation.
- Name the radioactive gas which accounts for a large fraction of our exposure.
 - What name is given to the radiation which comes from space?
 - State another major source of background radiation.
 - Explain why the crew of an airliner may be exposed to higher than average radiation levels in the course of their work.
- 5** When a radioactive atom emits radiation we say that it 'decays'.
- Which part of the atom emits radiation?
 - Which type of radiation is a form of electromagnetic radiation?
 - What particles make up an alpha particle?
 - Which type of radiation is the same as an electron?
 - Which **two** types of radiation have an electrical charge?
 - Which type of radiation is undeflected if it passes through an electric or magnetic field?

- 6** A nucleus of carbon-14 decays to form a nucleus of nitrogen-14. Here is the partial equation for this:



- Copy and complete the equation.
- Name the particle which the carbon-14 nucleus emits.
- What charge does this particle have?

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- 7 Which type of radiation from a radioactive substance ...
- a is the most penetrating?
 - b has the strongest ionising effect as it passes through another material?
 - c can be absorbed by a few centimetres of air?
 - d can pass easily through aluminium foil?
- 8 A sample of a radioactive substance initially contains 1600 undecayed atoms.
- a How many will remain undecayed after one half-life?
 - b How many atoms will decay during three half-lives?
 - c If 400 atoms remain undecayed after 30 minutes, what is the half-life of the substance?