

Physics - Key stage 4 - Atomic Structure

# Fission and Fusion

Mr van Hoek



# Fission and fusion

*Copy and complete the sentences using some of these keywords.*

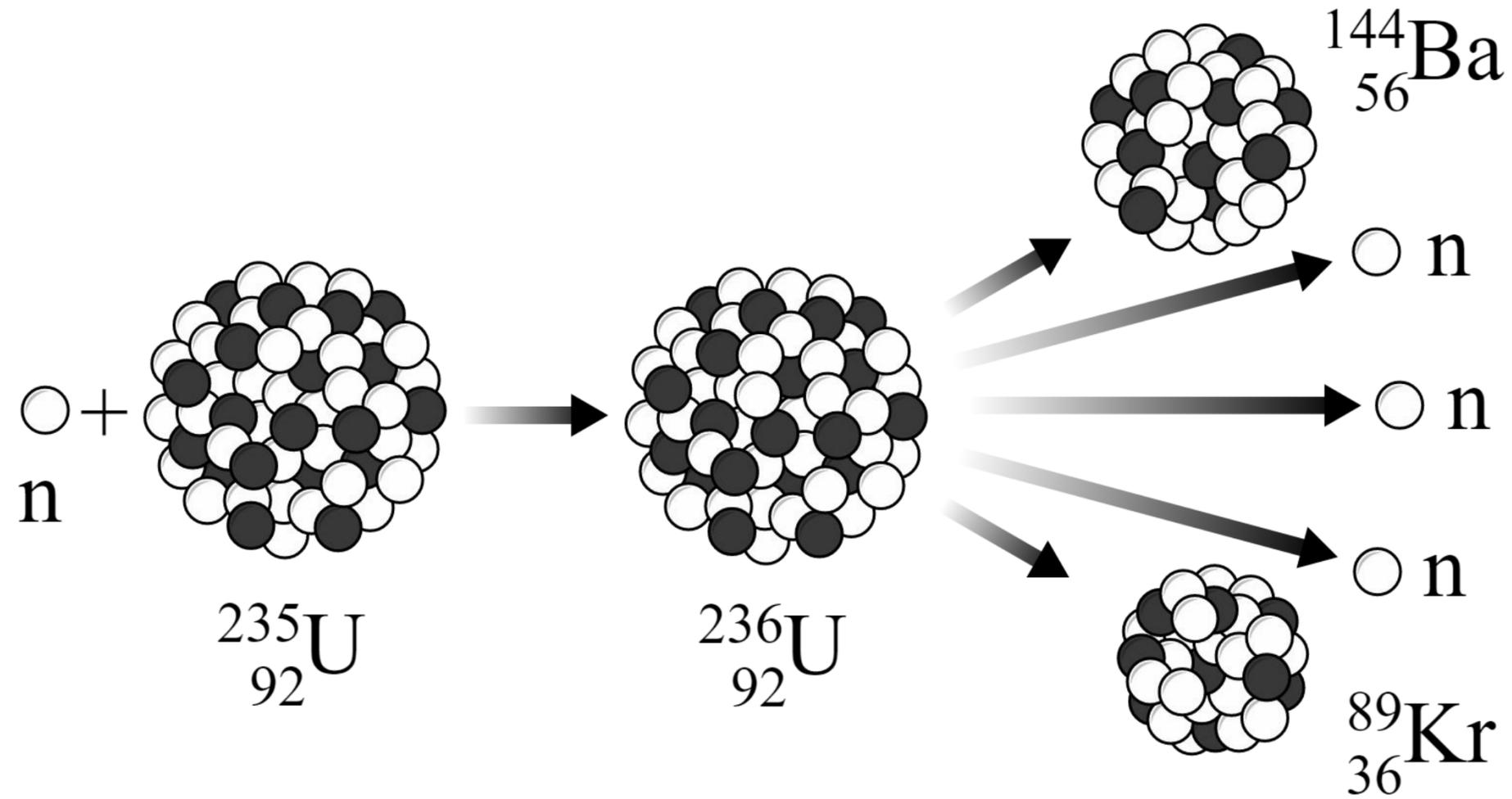
**large    small    join    split    smaller    larger    energy    neutron(s)**

Fission involves the \_\_\_\_\_ of \_\_\_\_\_ nuclei to produce \_\_\_\_\_ nuclei, two or three \_\_\_\_\_ and a large amount of \_\_\_\_\_.

Fusion involves the \_\_\_\_\_ of \_\_\_\_\_ nuclei to produce \_\_\_\_\_ nuclei, one additional \_\_\_\_\_ and a \_\_\_\_\_ amount of energy.



# Fission



Credit : wikimedia, MikeRun, Illustration of a typical nuclear fission reaction



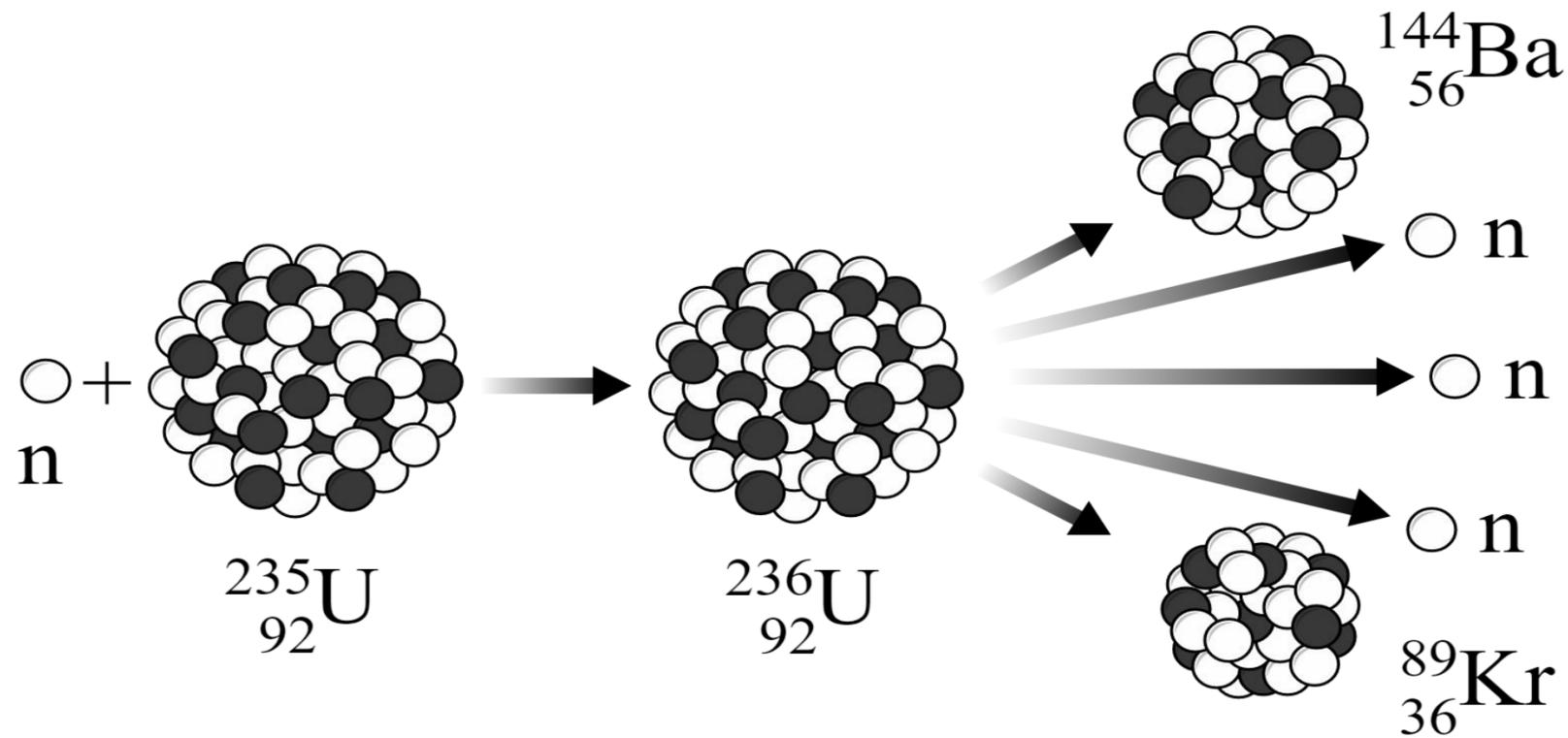
# Sort the statements into the correct order

1	A uranium-235 nucleus absorbs a neutron.
	2 or 3 neutrons, gamma rays and...
	Control rods will absorb some of neutrons to control the <b>chain reaction</b> .
	This nucleus undergoes <b>fission</b> and produces 2 smaller smaller nuclei.
	...energy is released and given to the particles as kinetic energy.
	This creates uranium-236 - a very unstable nucleus.



# Independent writing

Describe and explain how the process of nuclear fission releases energy from Uranium-235 nuclei, and how the chain reaction is control.



Credit : wikimedia, MikeRun, Illustration of a typical nuclear fission reaction



# Exam Question

Which statement describes nuclear fusion?

- A. Two hydrogen nuclei join to form a helium nucleus.
- B. A helium nucleus joins with a hydrogen nucleus to form an alpha particle.
- C. Uranium nuclei split and produce high energy neutrons causing a chain reaction.
- D. Two helium nuclei join to form a hydrogen nucleus.

OCR, Specimen, J249/04



# Exam Question

Nuclear power stations are used to generate electricity.

Nuclear scientists must make sure that nuclear reactions do not go out of control.

They can place control rods in the reactor.

Explain what the control rods do and why they cannot remain in the reactor all the time.

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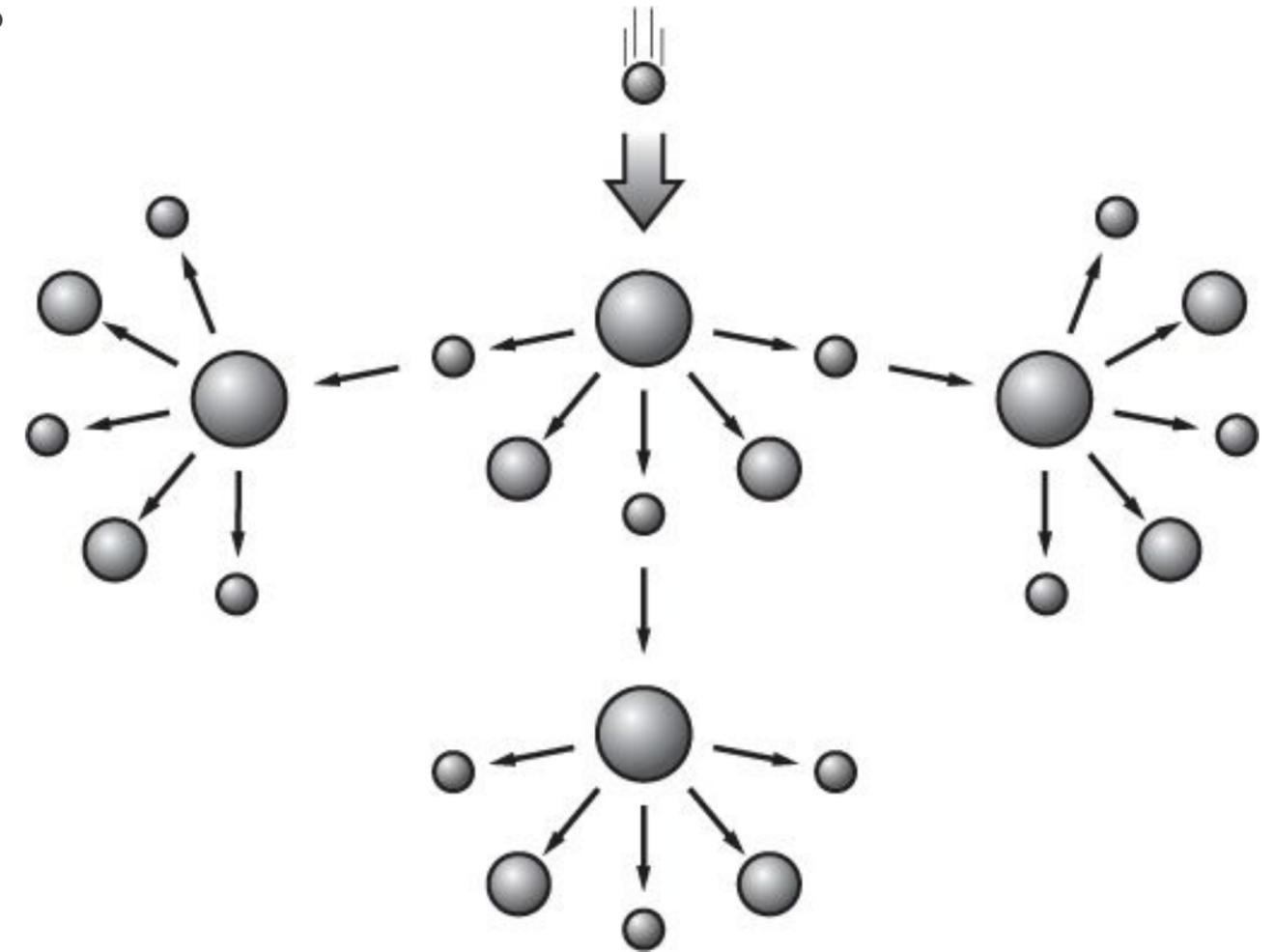


# Exam Question

Carlos draws a diagram to show what happens in a chain reaction.

Label the diagram and use it to explain what happens in a chain reaction.

Describe the differences between a chain reaction in a nuclear reactor and in a nuclear bomb. [6]



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