1. Explain **two** safety precautions that should be used when handling a alpha particles.

2. Explain how the results from Rutherford's sc[illegible]ng experiment ar

3. Outline an experiment to investigate how the intensity of radiation v the source. You do not need to include how you would analyse the

4. Explain why the importance of correcting for background radiation in an experiment is lower.

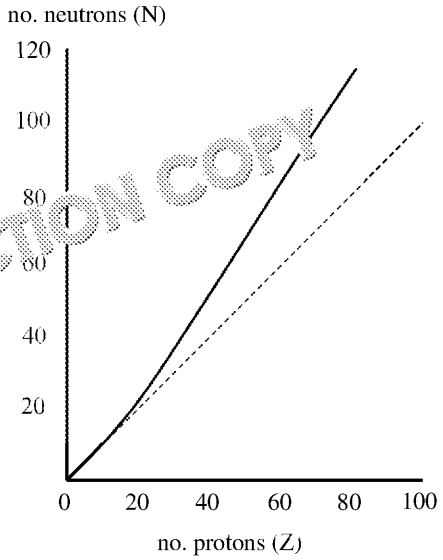
5. A student investigated the variation of activity with time for a labor radioactive source. The results are shown in the table.

t / s	A / s^{-1}
0	854
60	465
120	287
180	148
[illegible]	91
[illegible]	42
360	29
420	19

(a) [illegible] the results in the table to generate a set of derived results t[illegible]ght-line graph.
(b) Plot the graph from your derived results and complete it with a
(c) Determine the gradient from your graph. Show your working.
(d) Use your gradient to determine the decay constant for protactini

6. The half-life of radon-222 is 91.2 hours. Calculate the time in hours of radon-222 to decay to 65 % of its original activity.

7. The graph shows the variation in neutron number with proton numbe
One particular nuclide, P, is represented by a dot on the graph.



This nuclide decays by emission of:

- one beta minus particle to form nuclide R
- one beta minus particle to form nuclide S
- one alpha particle to form nuclide T

Show this decay series on a graph of N against Z. You do **not** need
graph printed here.

8. In an experiment to deter[illegible]th [illegible]uclear radius of $^{27}_{13}Al$, alpha par
Calculate the for[illegible] on an alpha particle when it is 250 fm a
ato[illegible] Assume there are no other forces from any other par

9. The equation shows a nuclear fission reaction and the masses, in ato
reactants and products.

$$^{235}_{92}U + {}^{1}_{0}n \rightarrow {}^{133}_{51}Sb + {}^{99}_{41}Nb + 4($$

235.0439 + 1.0087 132.9152 + 98.9116 + 4.034

Calculate the energy released when one mole of uranium-235 under

Preview of Questions Ends Here