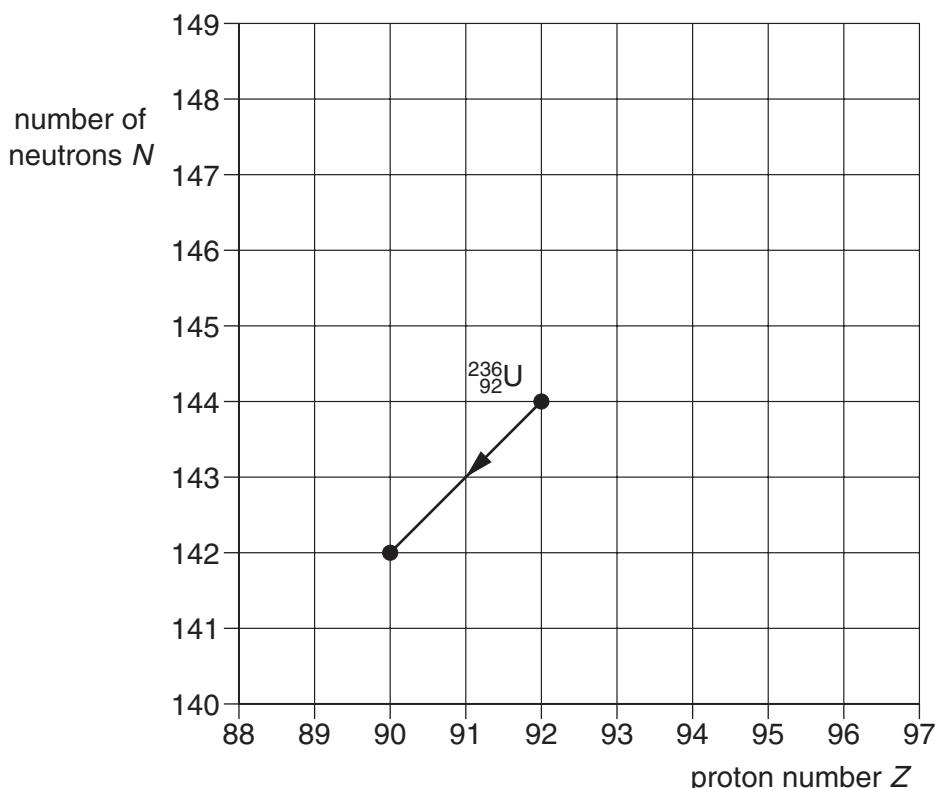


- 7 Uranium-236 ( $^{236}_{92}\text{U}$ ) and Uranium-237 ( $^{237}_{92}\text{U}$ ) are both radioactive.  
 Uranium-236 is an  $\alpha$ -emitter and Uranium-237 is a  $\beta$ -emitter.

- (a) Distinguish between an  $\alpha$ -particle and a  $\beta$ -particle.

.....  
 .....  
 .....  
 .....  
 .....  
 .....  
 ..... [4]

- (b) The grid of Fig. 7.1 shows some proton numbers  $Z$  on the  $x$ -axis and the number  $N$  of neutrons in the nucleus on the  $y$ -axis.



**Fig. 7.1**

The  $\alpha$ -decay of Uranium-236 ( $^{236}_{92}\text{U}$ ) is represented on the grid. This decay produces a nucleus of thorium (Th).

- (i) Write down the nuclear equation for this  $\alpha$ -decay.

..... [2]

- (ii) On Fig. 7.1, mark the position for a nucleus of

1. Uranium-237 (mark this position with the letter U),
2. Neptunium, the nucleus produced by the  $\beta$ -decay of Uranium-237 (mark this position with the letters Np). [2]

**BLANK PAGE**

**BLANK PAGE**

**BLANK PAGE**

---

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

University of Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.