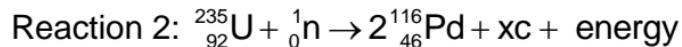


- 7 A nucleus of Uranium-235 may be made to undergo fission when bombarded by a neutron. When Uranium-235 nuclei undergo fission with a slow-moving neutron, two possible reactions that may occur are



- (a) For reaction 2, identify the particle c and the number x of such particle(s) produced in this reaction.

particle c =

x = [2]

- (b) The binding energy per nucleon E for a number of nuclides is given in Fig. 7.1.

| Nuclide | E / MeV |
|------------------------|-----------|
| $^{95}_{38}\text{Sr}$ | 8.74 |
| $^{139}_{54}\text{Xe}$ | 8.39 |
| $^{235}_{92}\text{U}$ | 7.60 |

Fig. 7.1

- (i) Explain what is meant by *binding energy* of a nucleus.

.....
..... [1]

- (ii) Determine the energy released in reaction 1.

$$\text{energy released} = \dots \text{J} [2]$$

- (iii) Hence, calculate the loss in mass in reaction 1.

$$\text{loss in mass} = \dots \text{kg} [2]$$

- (iv) The energy released in reaction 2 is 163 MeV. Suggest, with a reason, which of the two reactions is more likely to occur.

.....
.....
.....
..... [3]