

- 5 (a) (i) State what is meant by nuclear binding energy.

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.....
.....

[2]

- (ii) On Fig. 5.1, sketch a line to show the variation with nucleon number A of the binding energy per nucleon E of a nucleus.

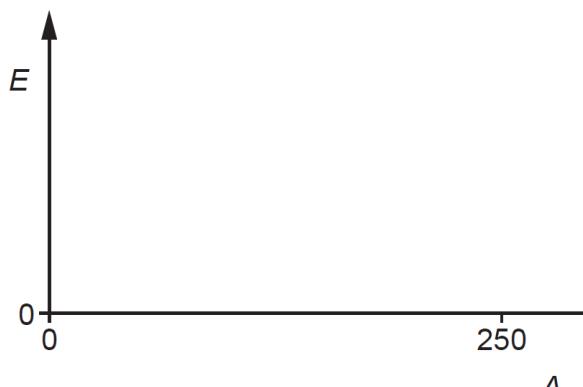
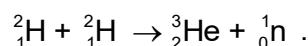


Fig. 5.1

[1]

- (b) In one type of nuclear process, deuterium (${}^2_1\text{H}$) undergoes the reaction



- (i) State the name of this type of nuclear process.

..... [1]

- (ii) Explain, with reference to your line in (a)(ii), why this reaction results in the release of energy.

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.....
.....

[2]

- (c) Table 5.1 shows the masses of the particles involved in the reaction in (b).

Table 5.1

particle	mass/u
${}_0^1n$	1.008 665
${}_1^2H$	2.014 102
${}_2^3He$	3.016 029

Calculate the energy released when 1.00 mol of deuterium undergoes the reaction.

energy = J [5]