



- 5 (a) (i) Write the nuclear equation for the reaction when a nucleus of deuterium ( ${}^2_1\text{H}$ ) collides with a mercury nucleus ( ${}^{198}_{80}\text{Hg}$ ) to form a gold nucleus ( ${}^{196}_{79}\text{Au}$ ) and another particle.

[2]

- (ii) State the name of the other particle.

[1]

- (b) (i) Table 5.1 shows the masses of the particles in (a)(i).

Table 5.1

particle	mass/u
${}^2_1\text{H}$	2.014 u
${}^{198}_{80}\text{Hg}$	197.967 u
${}^{196}_{79}\text{Au}$	195.966 u
the other particle	4.002 u

Deduce the energy change during the reaction.

energy change = ..... J [4]

- (ii) Suggest why this reaction is not used commercially to make gold from the much cheaper mercury.

[2]

[Total: 9]



\* 0009977199813 \*



13



**Please turn over for question 6.**

