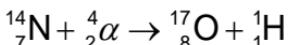


- 29 A stationary nitrogen nucleus reacts with a high speed  $\alpha$ -particle to produce a proton and a nucleus of an oxygen isotope as shown in the equation:



The masses of the nuclides involved are as follows

nuclide	mass / u
${}_{2}^{4}\alpha$	4.002604
${}_{1}^{1}\text{H}$	1.007825
${}_{7}^{14}\text{N}$	14.003074
${}_{8}^{17}\text{O}$	16.999130

Which is the minimum energy that the  $\alpha$ -particle possess in order for the reaction to occur?

- A  $1.9 \times 10^{-13}$  eV
- B  $4.0 \times 10^{-13}$  eV
- C 1.2 eV
- D  $1.2 \times 10^6$  eV