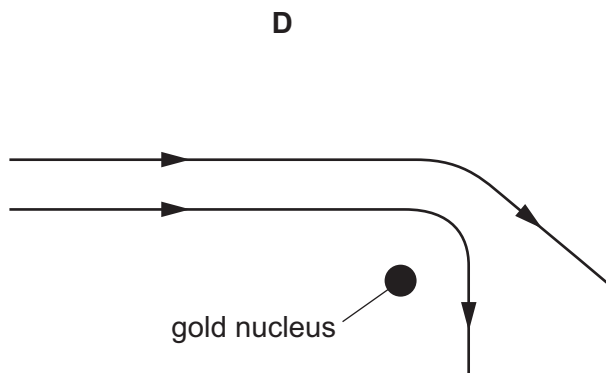
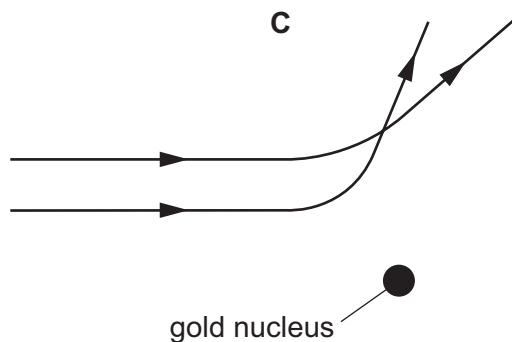
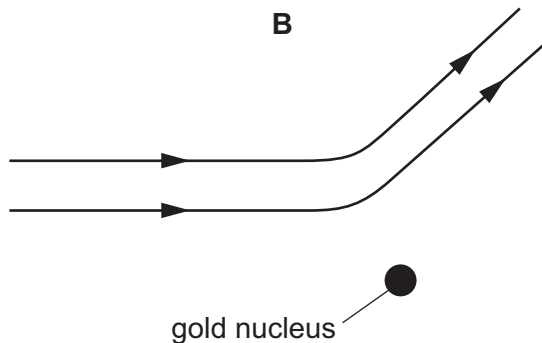
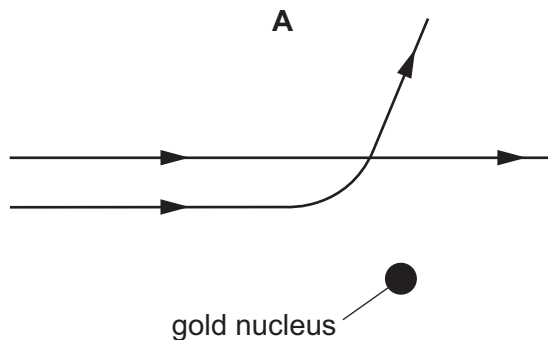


**38** Two  $\alpha$ -particles with equal energies are fired towards the nucleus of a gold atom.

Which diagram best represents their paths?



**39** When a nucleus emits an  $\alpha$  particle, how do the proton number and the nucleon number of the