39 A beam of α-particles is incident on a thin gold foil. One α-particle collides head-on with a gold nucleus and is deflected back along its original path.

Which statement could explain why the recoil speed of the gold nucleus is small compared with the recoil speed of the α-particle?

A Most α-particles are only slightly deflected as they pass through the gold foil.

B The α-particle and the gold nucleus repel each other.

C The mass of the gold nucleus is much greater than the mass of the α-particle.

D The momentum of the α-particle decreases as it approaches the gold nucleus.