Reading Decay Particles After a Field Reversal

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A classroom simulation sends one alpha particle, one beta-minus particle, and one gamma photon through a detector. Alpha particles are positive. Beta-minus particles are negative. Gamma photons are neutral. In the first field setting positive particles bend up and negative particles bend down. The bend size also depends on the particle’s motion.

Trace	Signed bend in first setting (model units)
P	+4
Q	−4
R	0

1 Which trace fits the gamma photon?

(1) P

(2) Q

(3) R

(4) P and Q

2 Use the signs to identify P and Q. Explain why the equal bend sizes do not identify them as the same particle type. [1]

Answer and work

The simulation reverses the field and keeps all starting motions and the field strength the same.

3 Predict the three signed readings after reversal. [1]

Answer and work

4 A simpler display reports only the size of each bend. Explain what evidence the class would lose by replacing the signed display. [1]

Answer and work