

- 7 (a) An electric field is set up between two parallel metal plates in a vacuum. The deflection of α -particles as they pass between the plates is shown in Fig. 7.1.

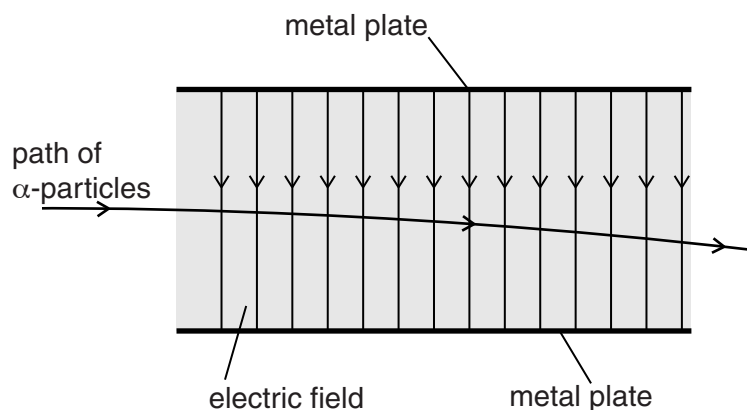


Fig. 7.1

The electric field strength between the plates is reduced. The α -particles are replaced by β -particles. The deflection of β -particles is shown in Fig. 7.2.

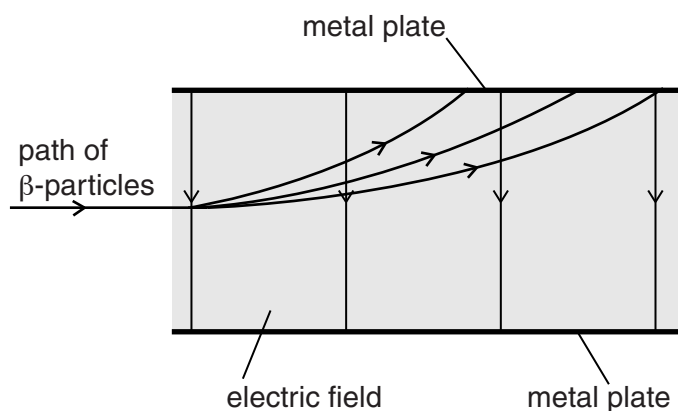


Fig. 7.2

- (i) State one similarity of the electric fields shown in Fig. 7.1 and Fig. 7.2.

.....
[1]

- (ii) The electric field strength in Fig. 7.2 is less than that in Fig. 7.1. State two methods of reducing this electric field strength.

1.
 2.
 [2]

- (iii) By reference to the properties of α -particles and β -particles, suggest three reasons for the differences in the deflections shown in Fig. 7.1 and Fig. 7.2.

1.

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2.

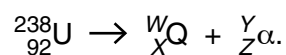
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3.

.....

[3]

- (b) A source of α -particles is uranium-238. The nuclear reaction for the emission of α -particles is represented by



State the values of W

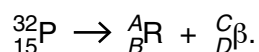
X

Y

Z

[2]

- (c) A source of β -particles is phosphorus-32. The nuclear reaction for the emission of β -particles is represented by



State the values of A

B

C

D

[1]