

- 5 Two ions A and B are linked to form a molecule and are situated in a uniform electric field, as shown in Fig. 5.1.

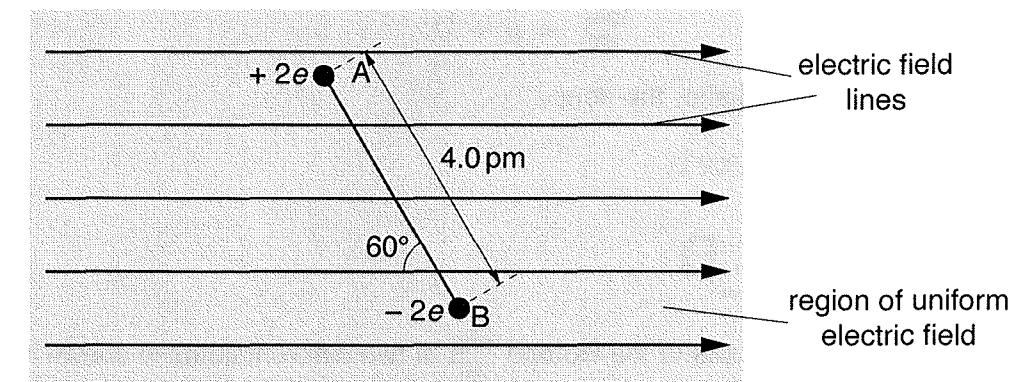


Fig. 5.1

The electric field strength is $1.5 \times 10^5 \text{ V m}^{-1}$. The line joining A and B is at an angle of 60° to the direction of the electric field.

The distance between A and B is 4.0 pm. The charge on A is $+2e$ and the charge on B is $-2e$.

(a) Calculate

(i) the force on A due to the electric field,

$$\text{force} = \dots \text{N} [1]$$

(ii) the electrostatic force on A due to B.

$$\text{force} = \dots \text{N} [3]$$

(b) Explain why the resultant force acting on the molecule AB is zero.

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..... [2]

(c) Calculate the torque on the molecule AB.

$$\text{torque} = \dots \text{Nm} [2]$$