

- 3 (a) Define *electric field strength*.

.....
[1]

- (b) A sphere S has radius $1.2 \times 10^{-6} \text{ m}$ and density 930 kg m^{-3} .

Show that the weight of S is $6.6 \times 10^{-14} \text{ N}$.

[2]

- (c) Two horizontal metal plates are 14 mm apart in a vacuum. A potential difference (p.d.) of 1.9 kV is applied across the plates, as shown in Fig. 3.1.

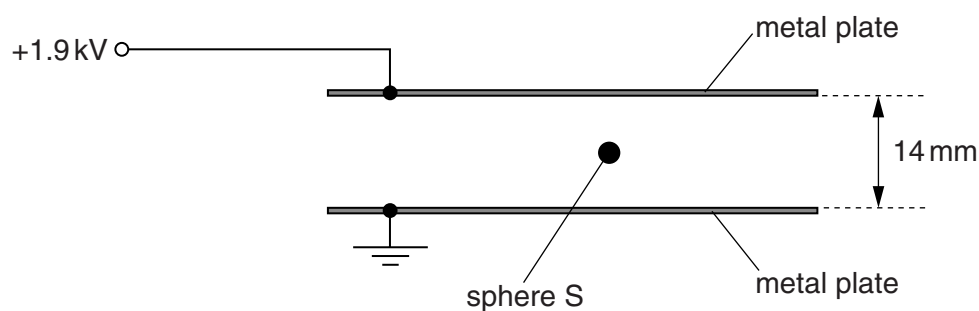


Fig. 3.1

A uniform electric field is produced between the plates.

The sphere S in (b) is charged and is held stationary between the plates by the electric field.

- (i) Calculate the electric field strength between the plates.

electric field strength = V m^{-1} [2]

- (ii) Calculate the magnitude of the charge on S.

charge = C [2]

- (iii) The magnitude of the p.d. applied to the plates is increased.
Explain why S accelerates towards the top plate.

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.....[2]

