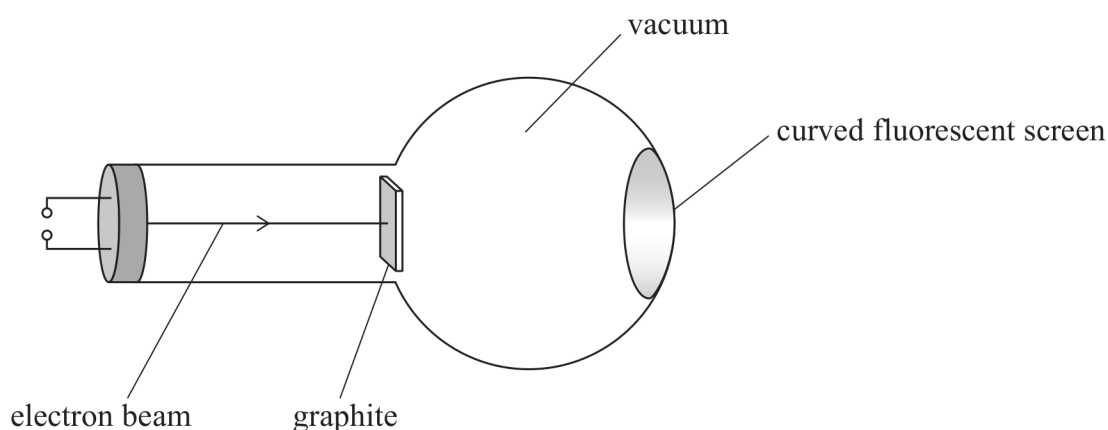
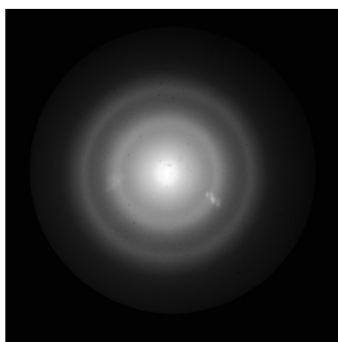


- 15 A teacher demonstrated the behaviour of electrons travelling through graphite. An electron beam was directed through a thin piece of graphite towards a fluorescent screen, as shown.



The electrons produced a pattern on the fluorescent screen as shown below.



(Source: © ANDREW LAMBERT PHOTOGRAPHY/SCIENCE PHOTO LIBRARY)

- (a) This demonstration can be used to make conclusions about the behaviour of the electrons and the structure of the graphite.

State these conclusions.

(4)

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(b) The electrons were accelerated through a potential difference (p.d.) of 2400 V before interacting with the graphite.

(i) Show that the work done on each electron is about  $4 \times 10^{-16}$  J.

(2)

(ii) Calculate the maximum velocity of the electrons.

(2)

Maximum velocity = .....

(iii) The accelerating p.d. was then increased.

Explain how the pattern on the screen would change.

(3)