

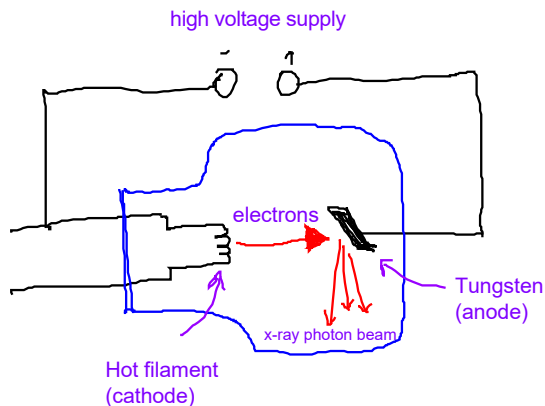
A Level Physics A

H556/02 Exploring physics

Question Set 30

- 1 (a) Describe the basic structure of an X-ray tube and explain how X-ray photons are produced.
You may draw a labelled diagram.

[3]



- Filament is heated, causing thermionic emission of electrons
- Electrons are accelerated across a high p.d.
- Electrons hit tungsten, transferring their KE into heat and X-ray photons

- (b) A beam of X-rays is directed at tissues in a patient.
The X-ray photons interact with the atoms of the tissues.

Simple scatter is one of the attenuation mechanisms.

Name and describe **two** other attenuation mechanisms.

[4]

- Photoelectric effect:
photon disappears and electron emitted from metal surface provided the frequency of photon is greater than threshold frequency and it contains energy more than the work function of metal.
- Pair production: photon disappears and electron-positron pair produced.

Total Marks for Question Set 30: 7

OCR

Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge