



SNS COLLEGE OF ALLIED HEALTH SCIENCES
SNS Kalvi Nagar, Coimbatore-35
Affiliated to The Dr.M.G.R Medical University, Chennai

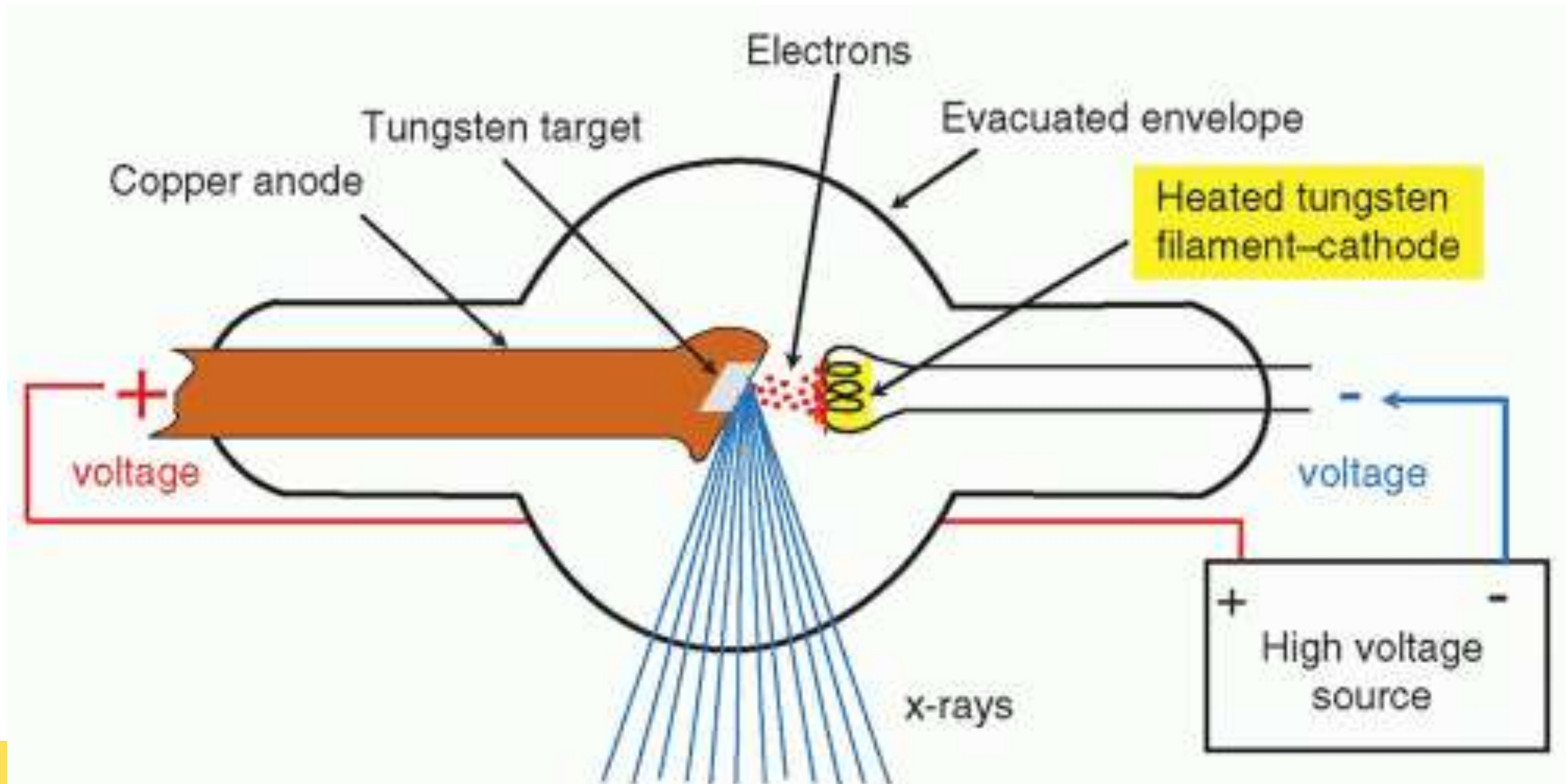


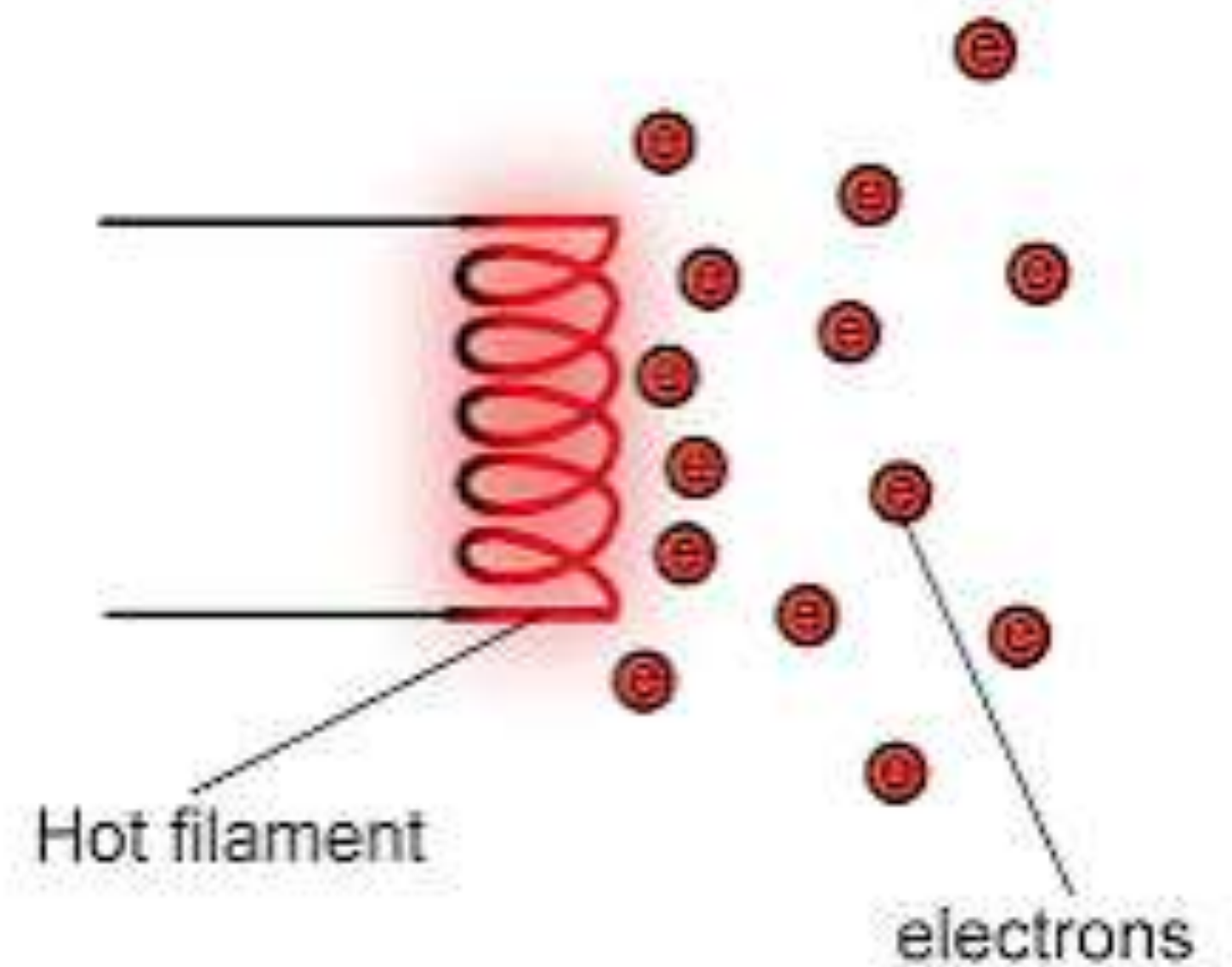
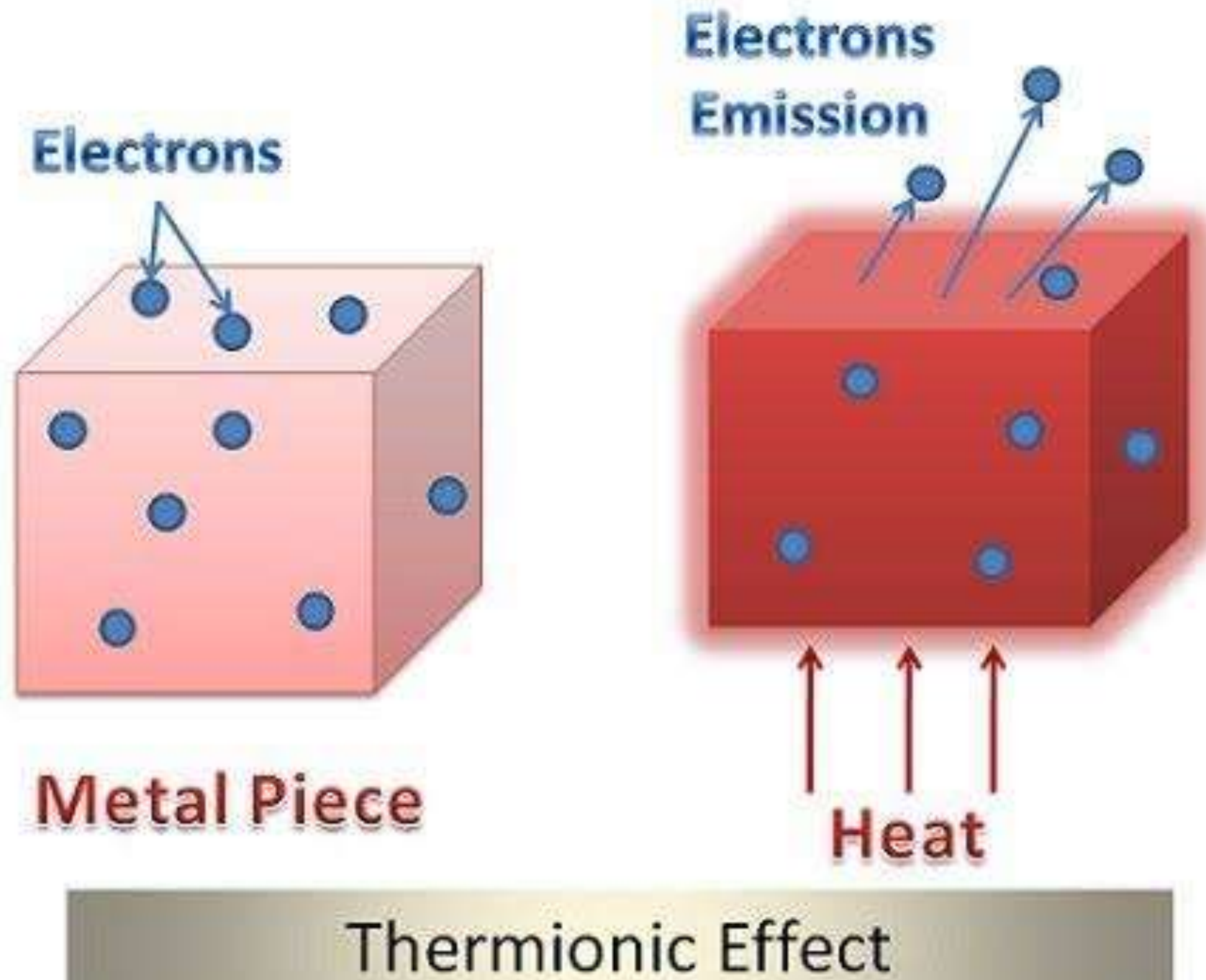
**DEPARTMENT OF RADIOGRAPHY AND IMAGING
TECHNOLOGY I YEAR**

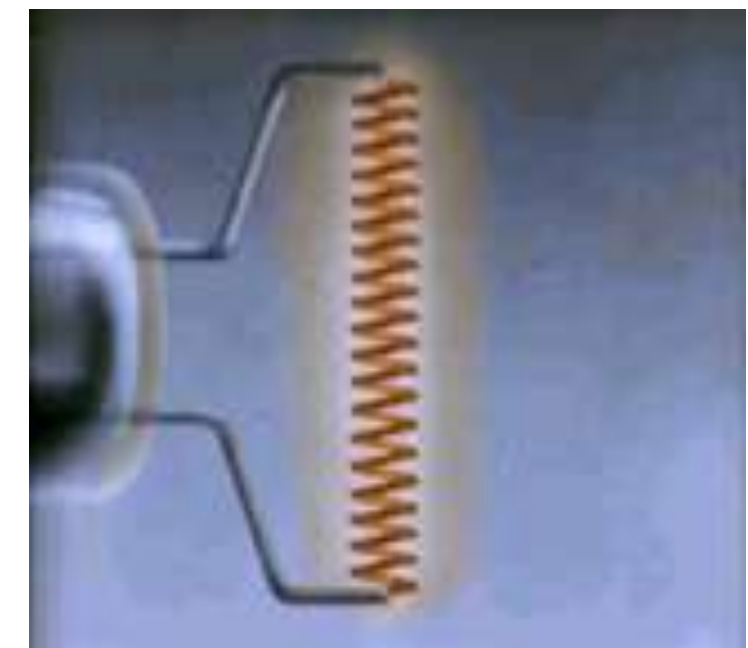
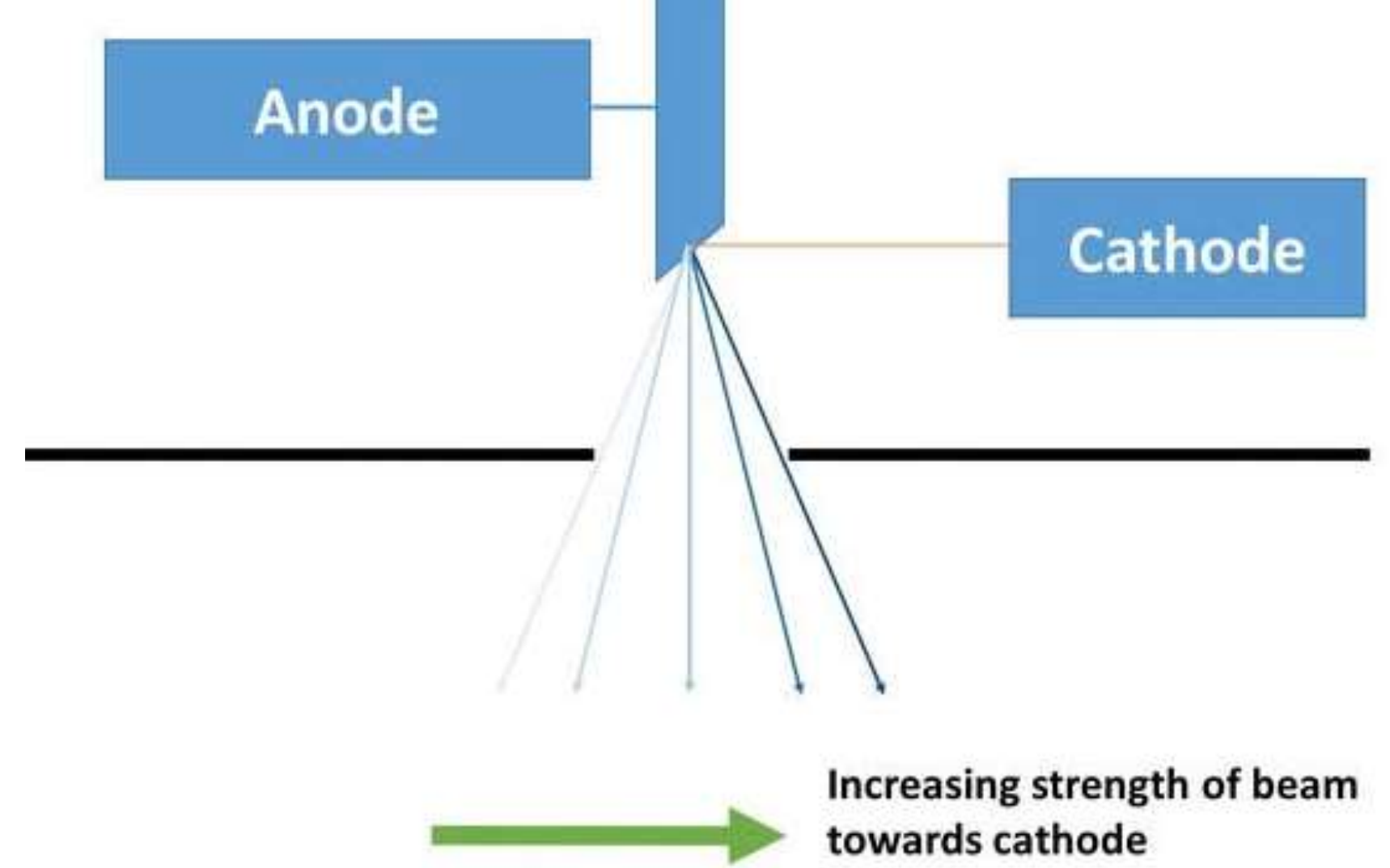
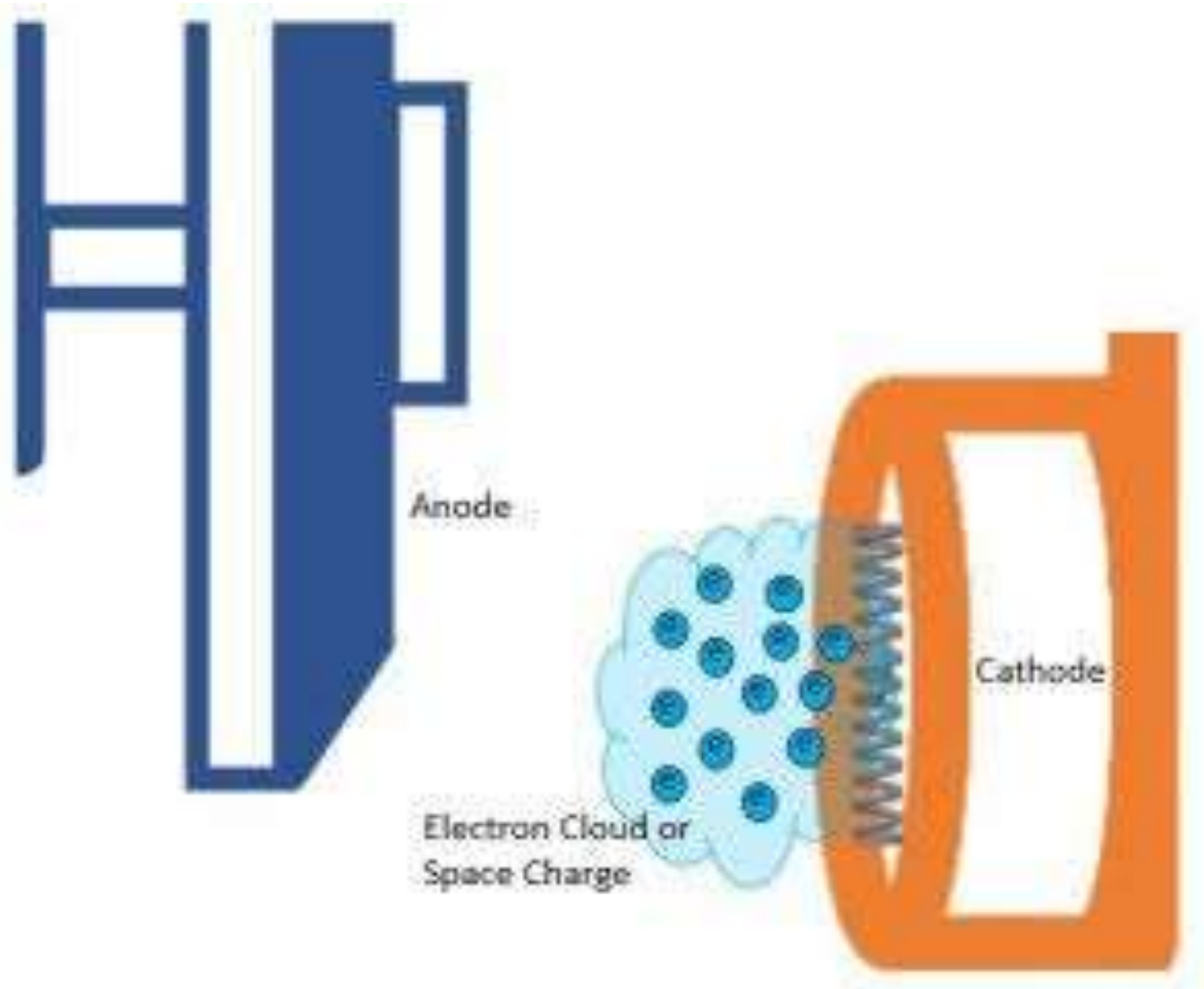
COURSE NAME : GENERAL PHYSICS

TOPIC : INTERACTION OF RADIATION WITH MATTER

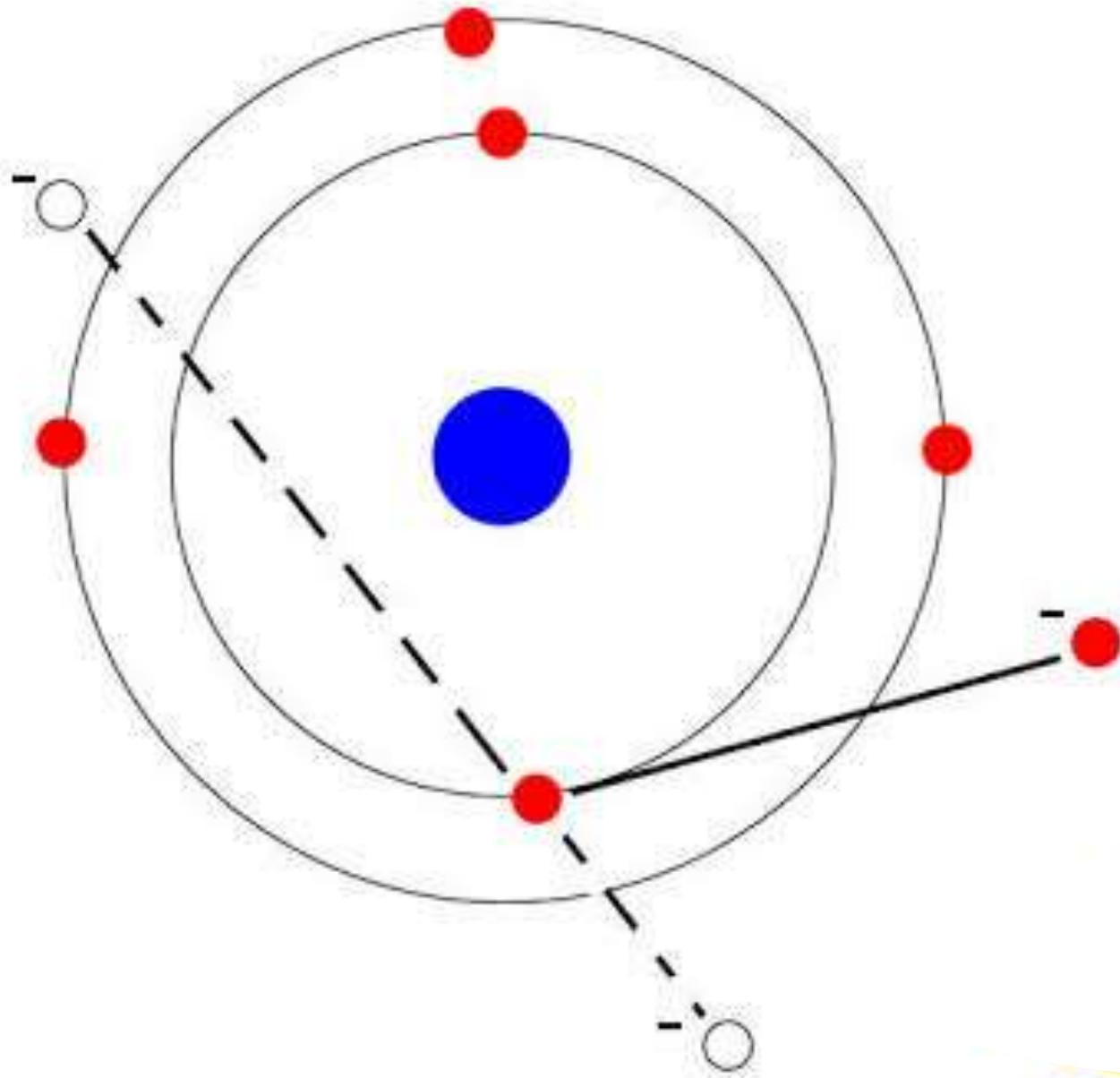
Interaction of electron with Target



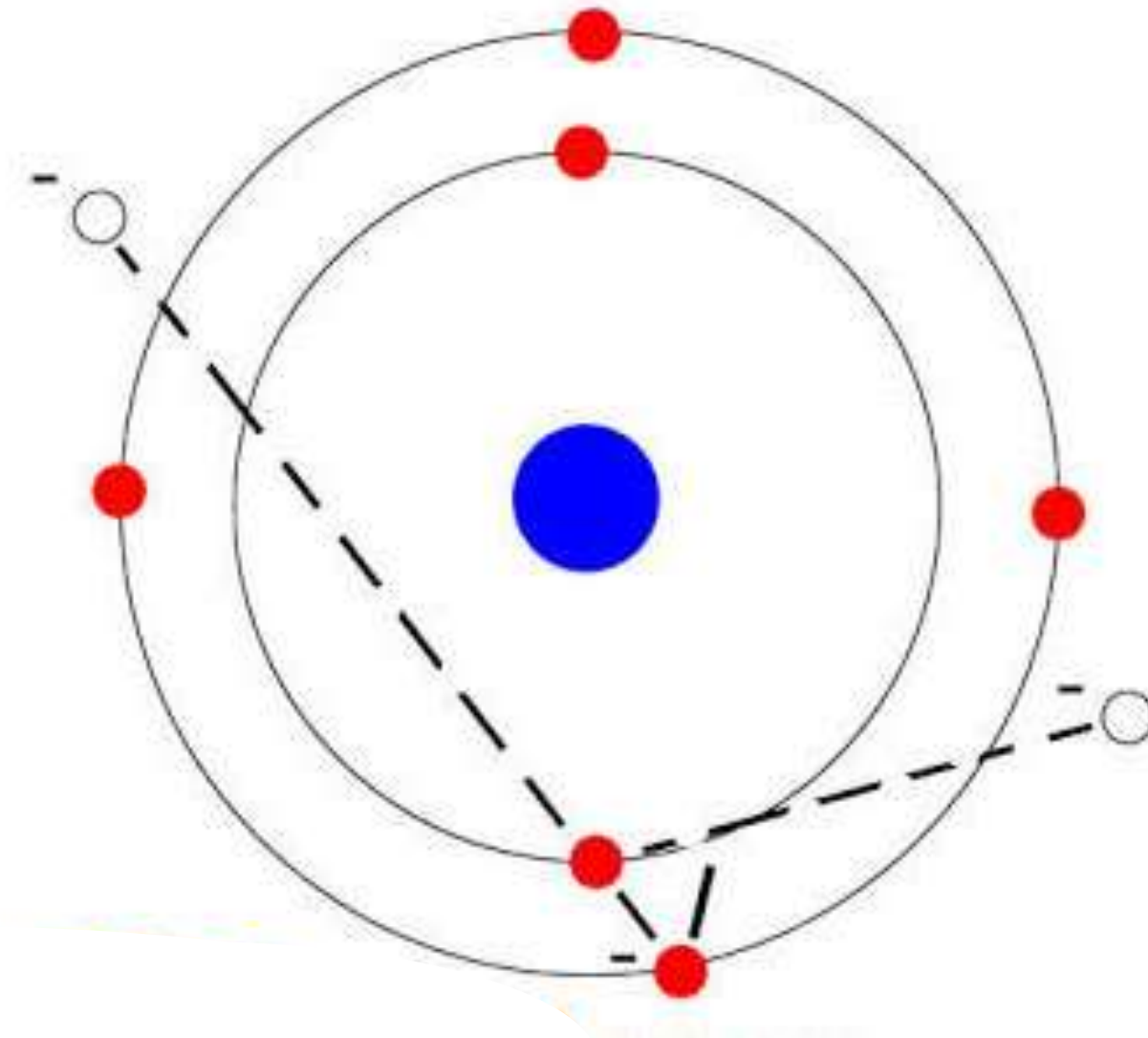




Ionisation



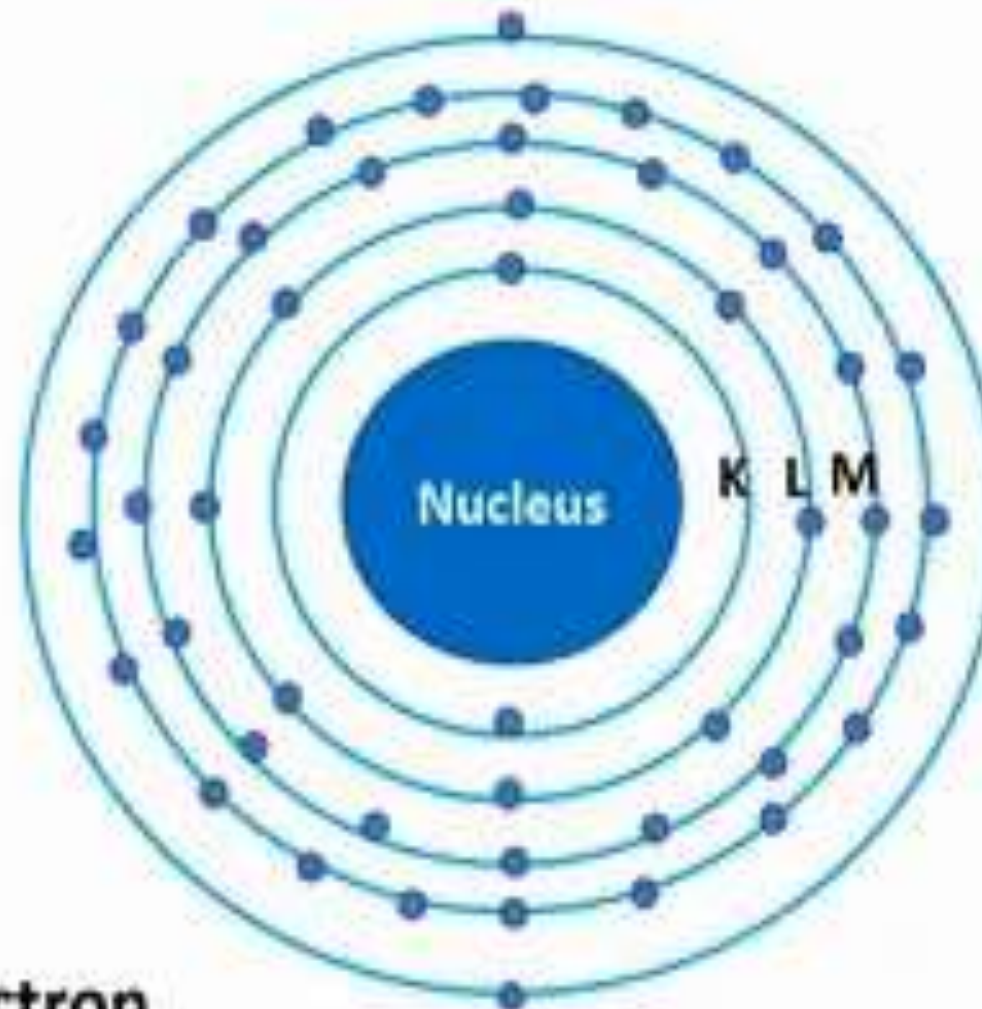
Excitation



How Are Medical X-Ray Generated (II)

Characteristic Radiation

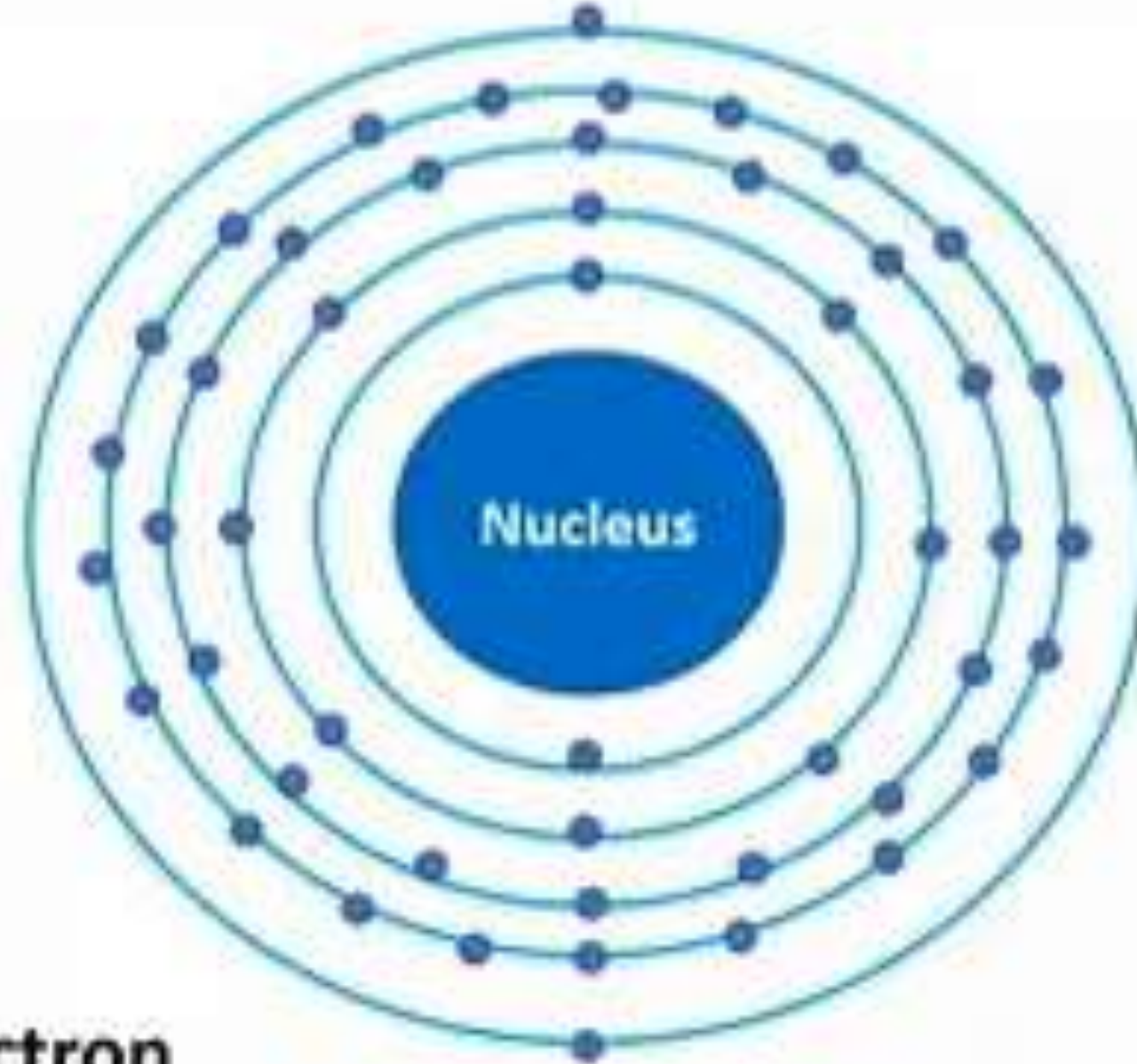
Electron Generating
Characteristic Radiation



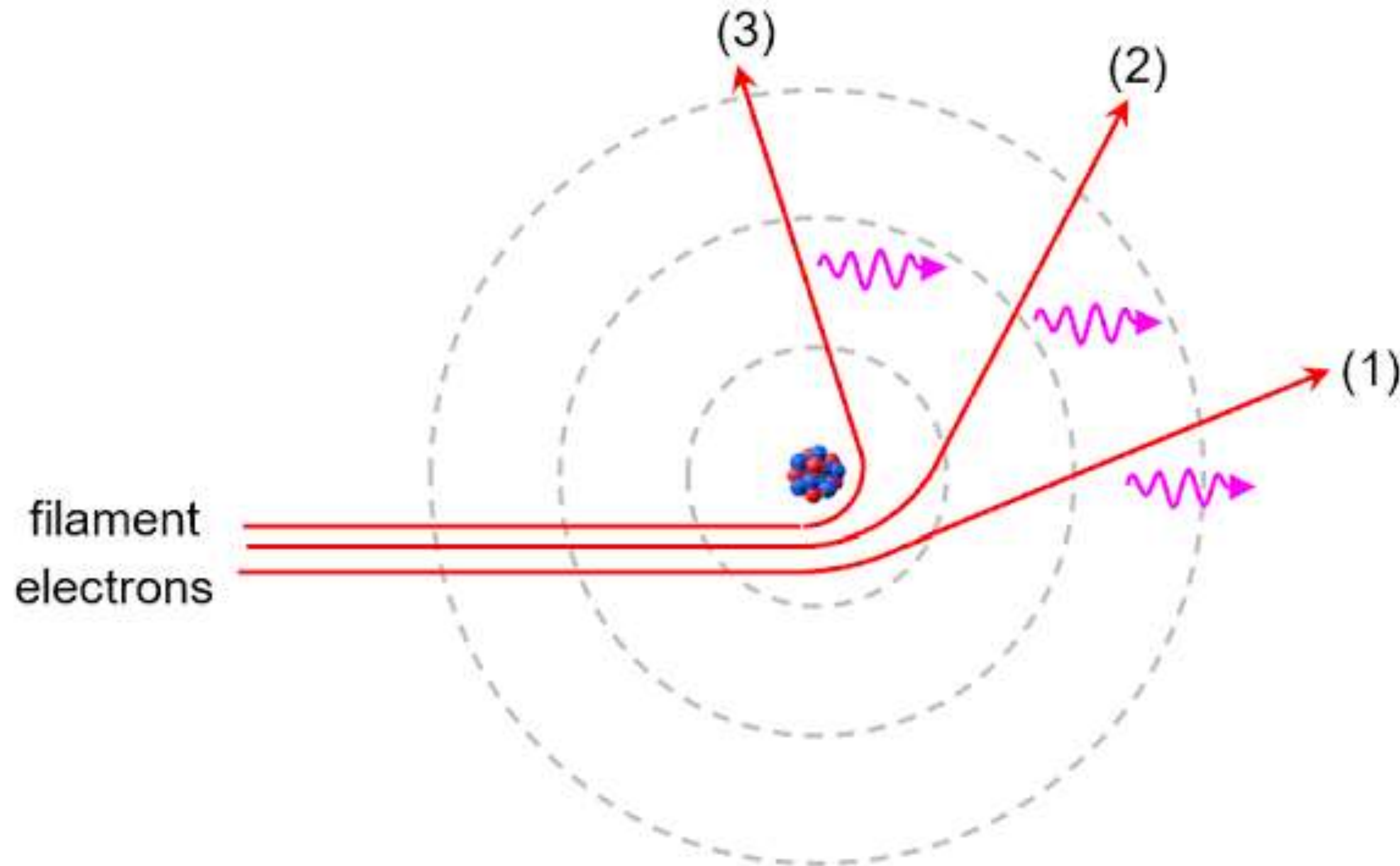
Electron
Cloud

How Are Medical X-Ray Generated (I)

Bremsstrahlung (Breaking Radiation)



Electron
Cloud



- (1) distant interaction produces low energy x-ray photon.
- (2) close interaction produces moderate energy x-ray photon.
- (3) maximum energy of x-ray photon is equal to energy of field electron.



Factors Affecting Quality and Intensity

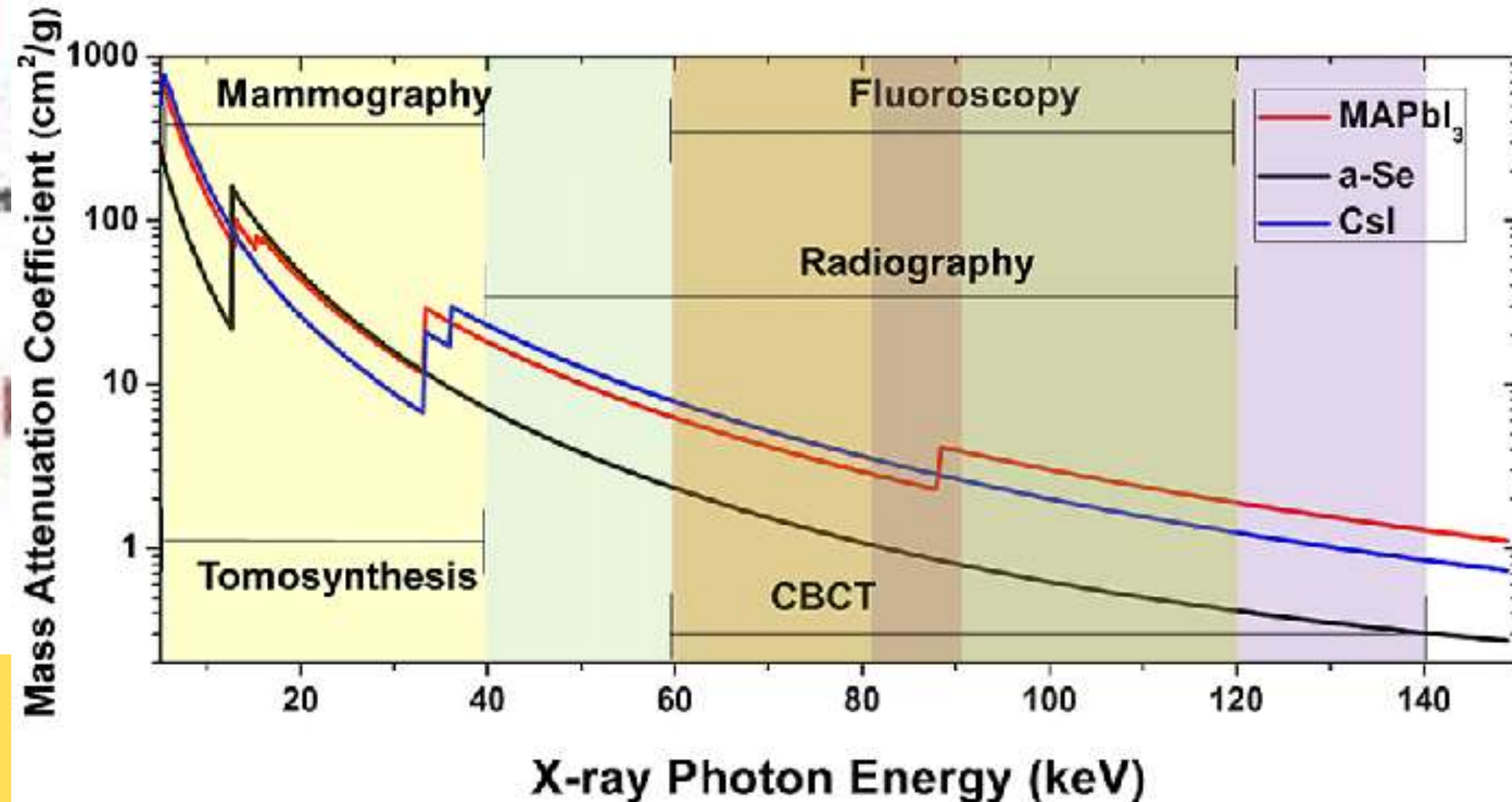
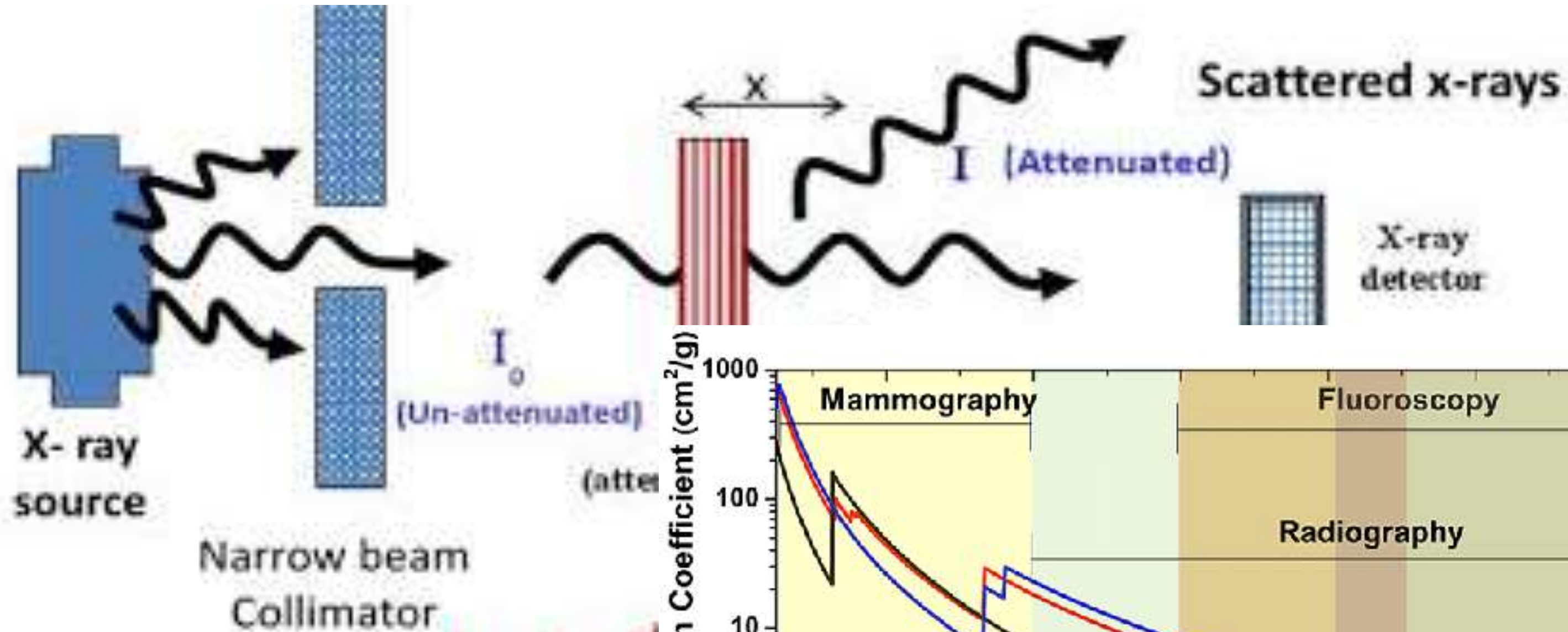


The X-ray production efficiency, quality, quantity and intensity are affected by seven factors namely:

- Applied voltage (KvP)
- Tube current (mA)
- Filtration
- Target material
- Exposure time (mAs)
- Generator waveform
- Distance.



Interaction of Radiation with Matter



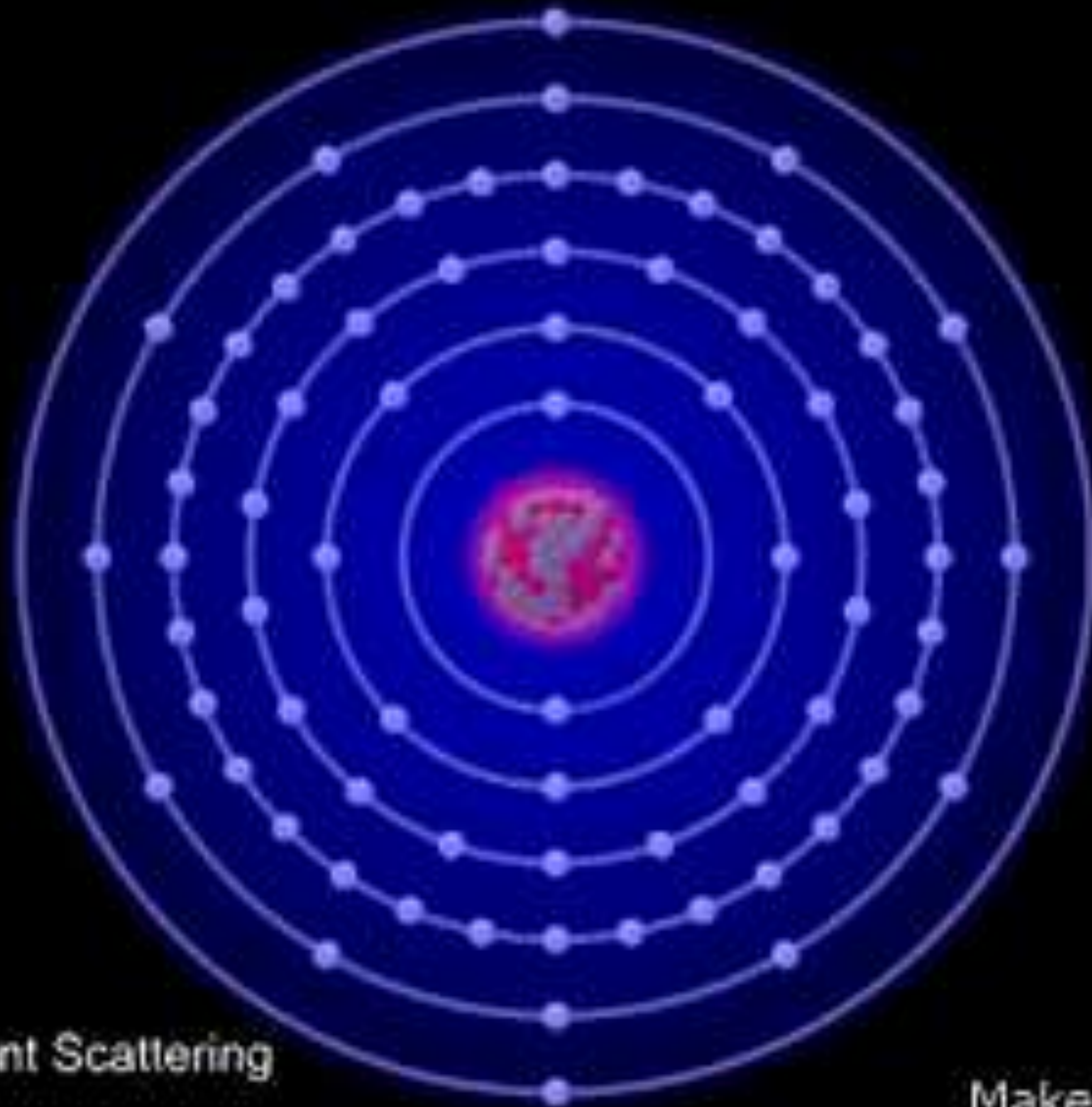


Interaction of Radiation with Matter



The attenuation of photon beam is caused by five important processes, namely,

- Coherent scattering
- Photoelectric absorption
- Compton scatter
- Pair production
- Photo nuclear disintegration.
- The Compton scatter and the photoelectric absorption are the two most important interactions in diagnostic radiology.
- At low photon energies the photoelectric interaction dominates the attenuation process, whereas Compton scatter is present at all energies.
- Pair production dominates at very high energies of radiation.

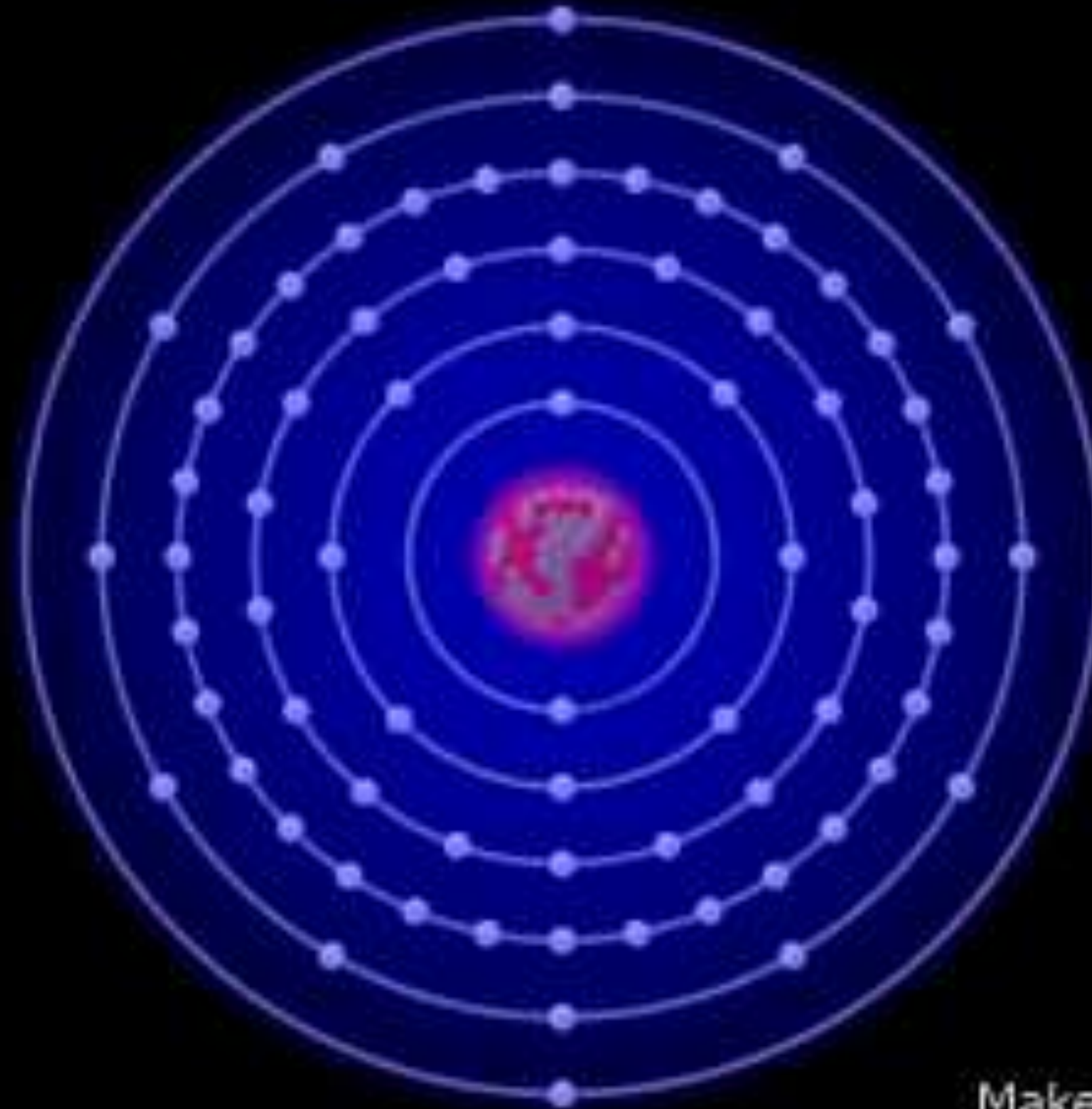


Coherent Scattering

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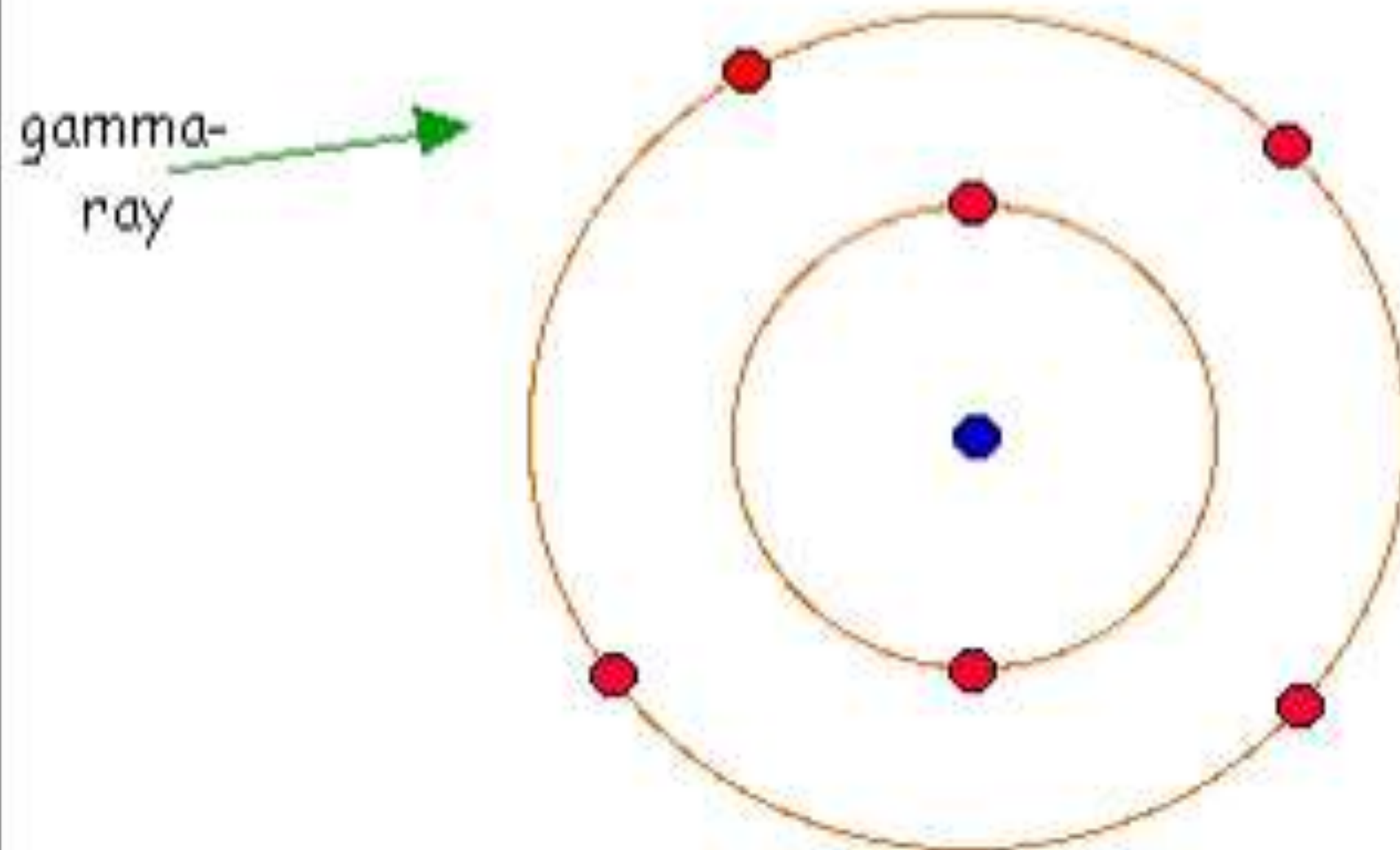
Photoelectric effect



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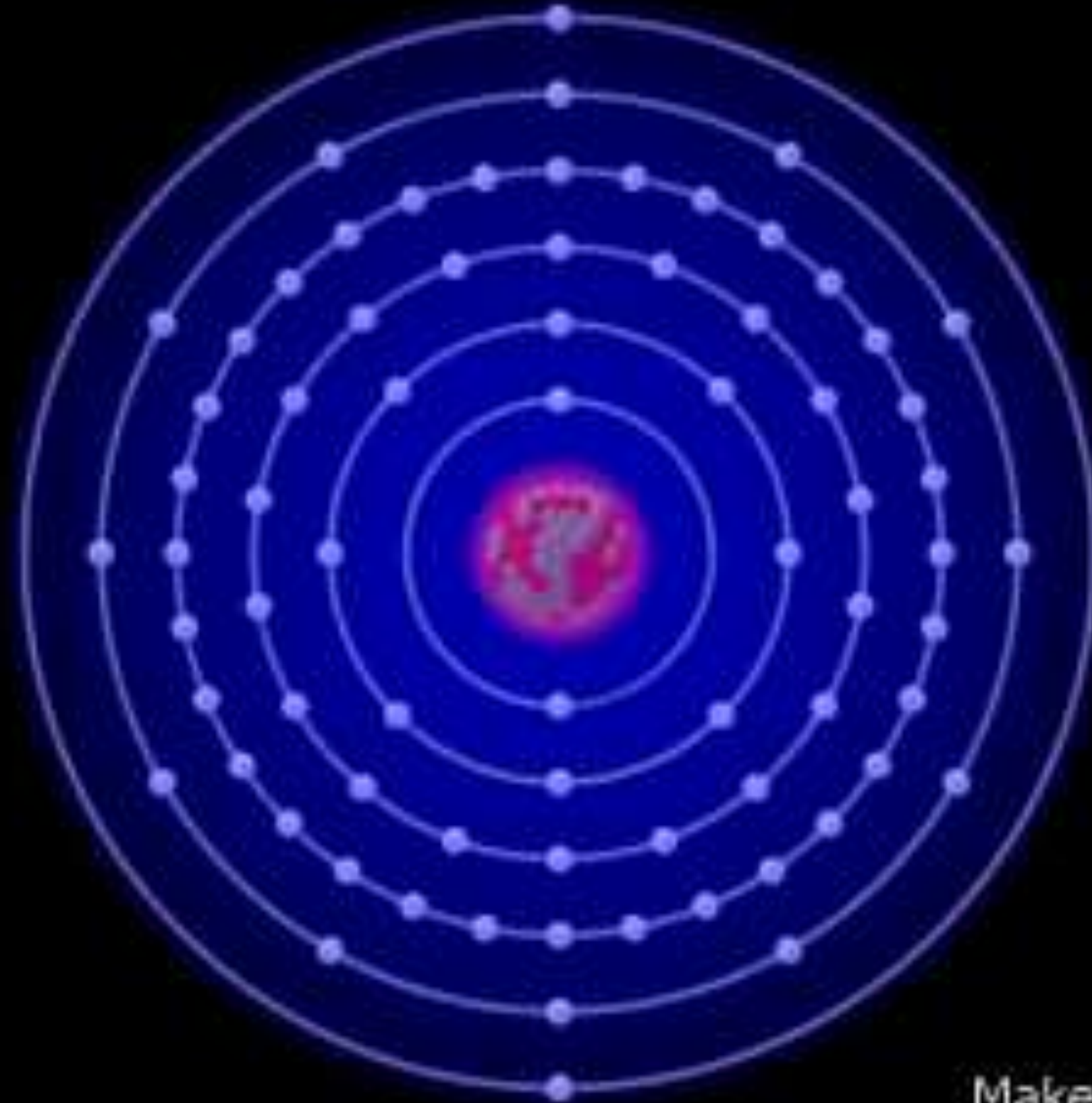
Compton effect

Scattered





Pair production



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