



石家莊鐵道大學
SHIJIAZHUANG TIEDAO UNIVERSITY

在线开放课程

X射线衍射技术

X射线谱

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在线开放课程

- X射线谱
- 连续X射线谱

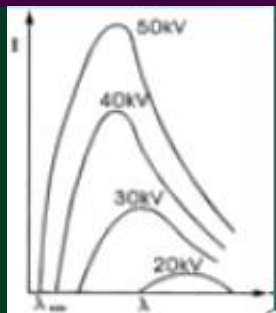
1. X射线谱

✓ 定义：X射线的强度与波长的关系曲线。

单位时间内通过
单位面积的X光
子的能量总和

单个X光子能量

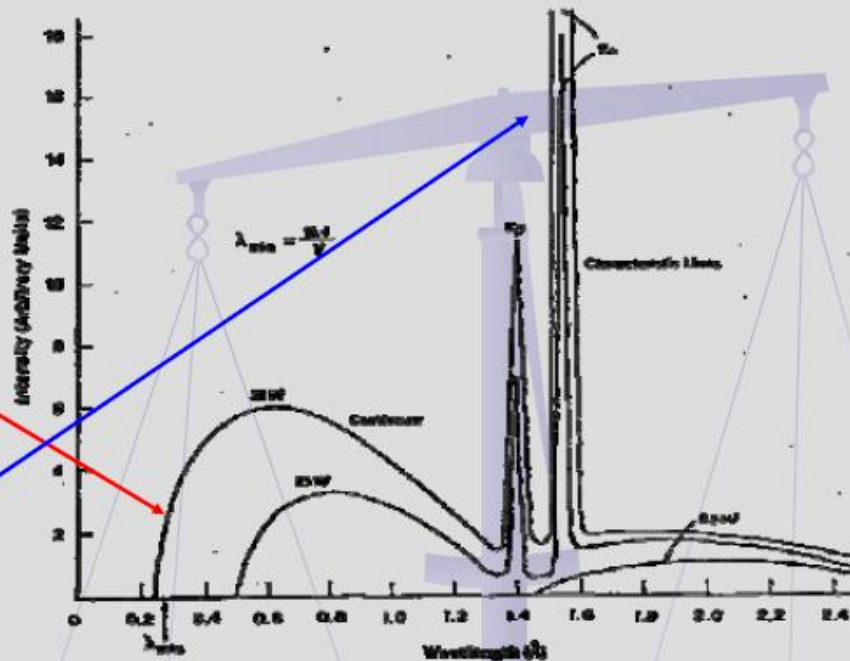
X光子的数量



强度：

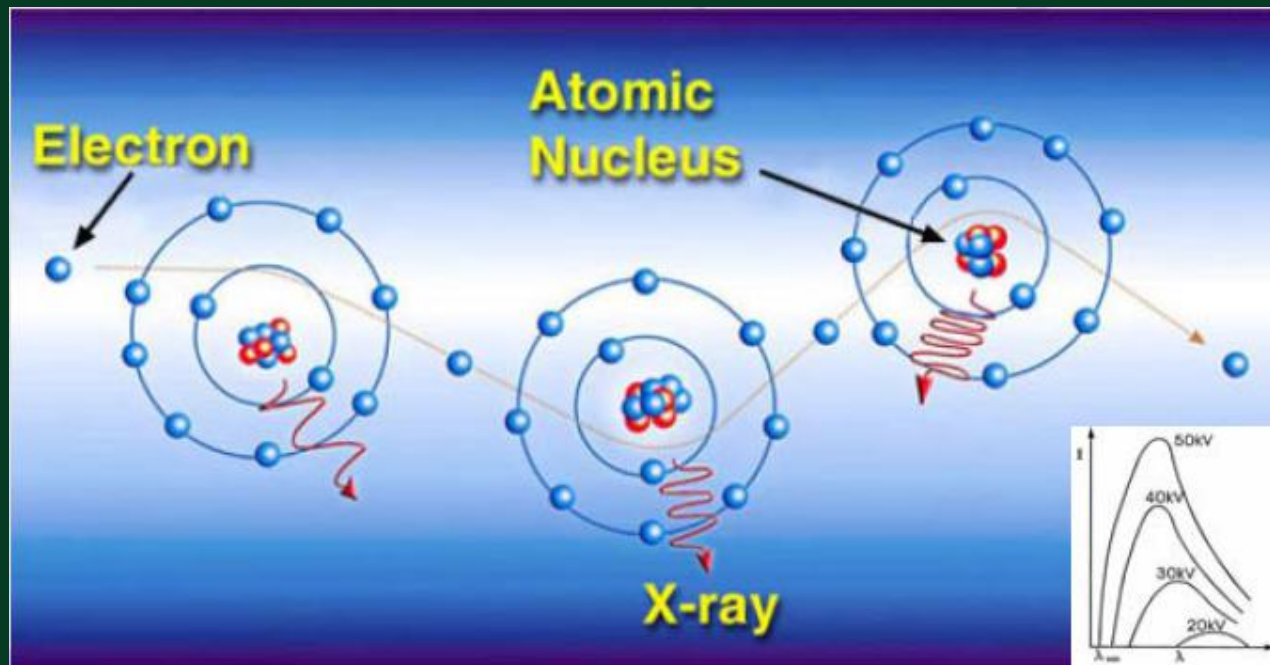
$$I = nh\nu$$

- X-rays created by accelerating electrons into target (copper).
- continuous radiation is created by deceleration of electrons—depends on accelerating voltage.
- Characteristic lines are dependent on target electronic structure, energies are independent of accelerating voltage.



Continuous and characteristic radiation for copper

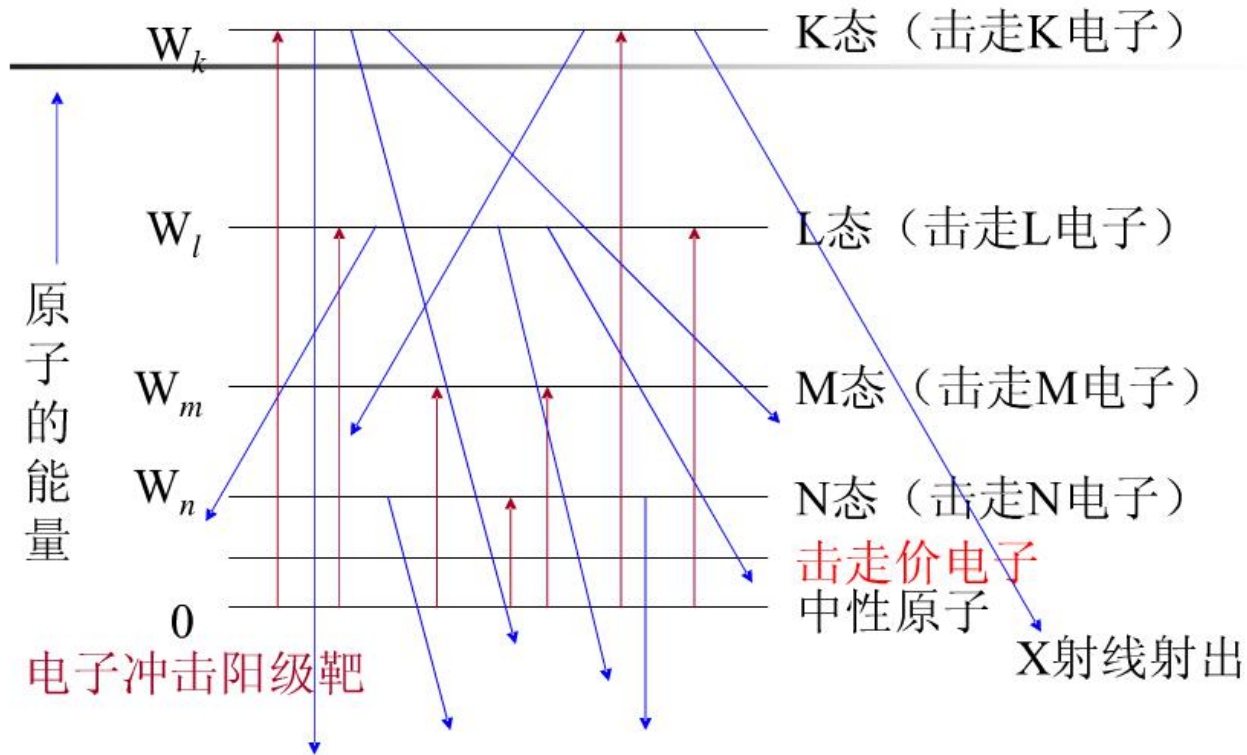
2. 连续X射线谱



$$h\nu_{\max} = eU = h \frac{c}{\lambda_0}$$

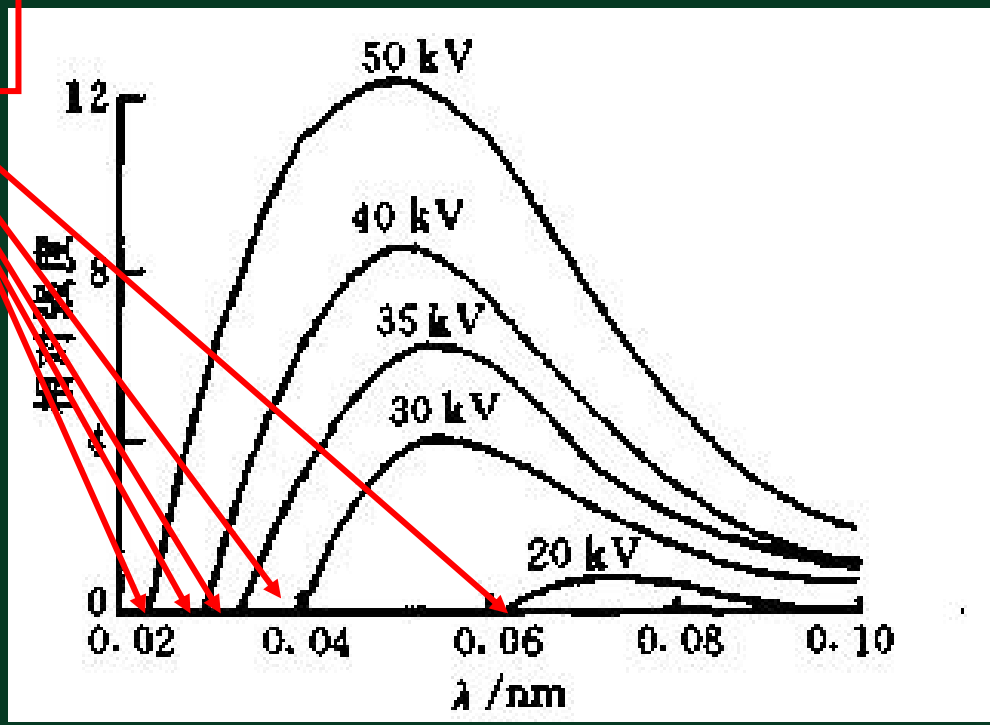


$$\lambda_0 = \frac{hc}{eU} = \frac{1240}{U} \text{ nm}$$

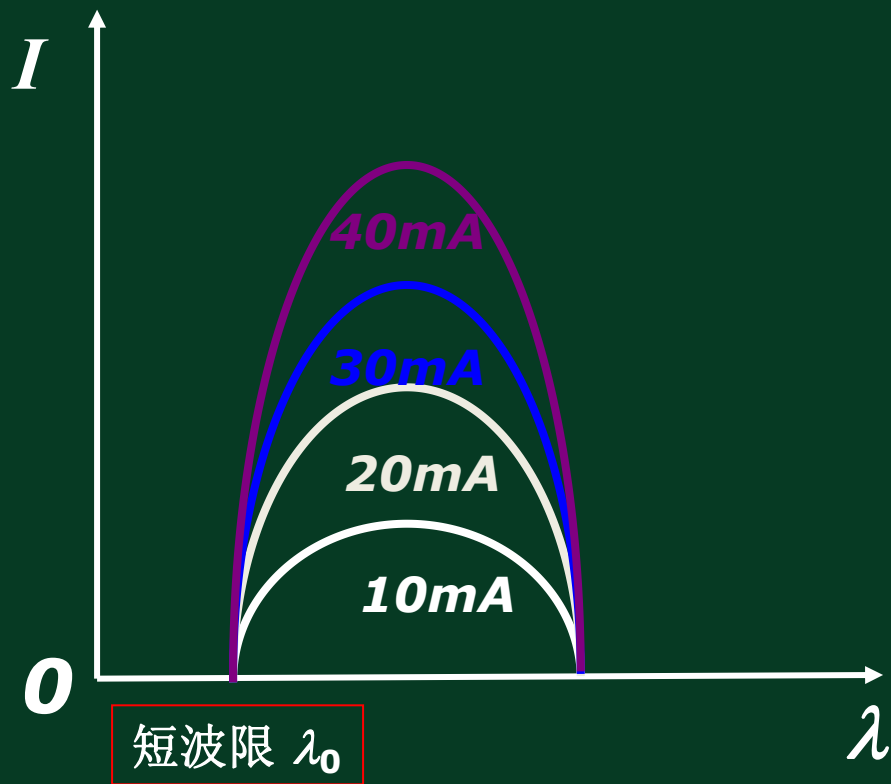


连续X射线产生过程

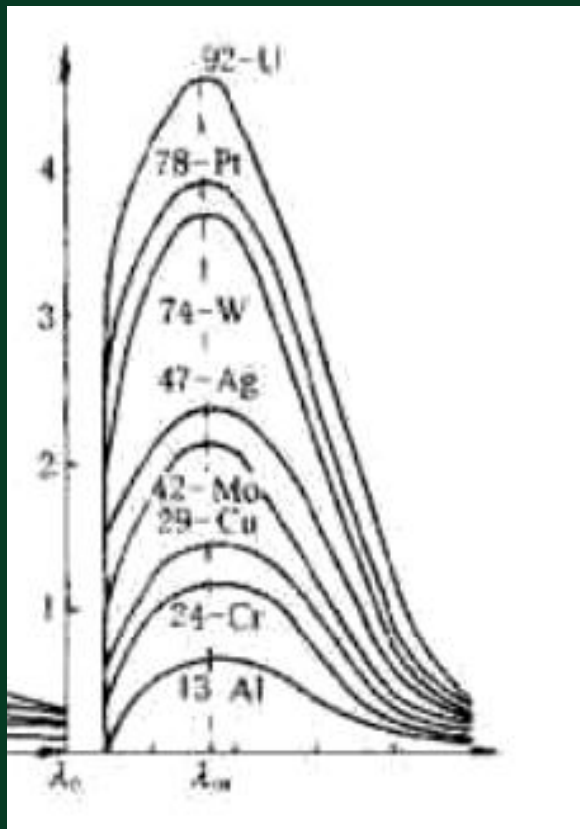
短波限 λ_0



管电压 (V) 对连续谱的影响 (钨靶)



管电流 (i) 对连续谱的影响 (钨靶)



靶材序数 (Z) 对连续谱的影响

小结



在线开放课程

连续X射线

电子与靶材的多次碰撞和电子数目大，从而产生各种不同能量的X射线，构成连续X射线。