

(4-28) Auger Process in Cr ($Z=24$)



n	Shell	# of electrons
1	K	2
2	L	8
3	M	8
4	N	6
		<u>24</u>

Calculate the K.E. of the Auger electron.

$$K_{\text{Auger}} = 6188 \text{ eV} - 30.6 \text{ eV} = 6157 \text{ eV}$$

In X-ray production the incident electron

ejects a K electron from the atom. An L electron ($n=2$)

goes to K shell to fill its place, However no photon is emitted. An electron from the N shell ($n=4$)

takes the excess energy (lost by L electron) and escapes. It is called an Auger electron.

$$E_n = -\frac{13.6 Z^2}{n^2}$$

$$E_1 = \frac{-13.6 \text{ eV} (24)^2}{(1)^2} = -7833 \text{ eV}$$

$$E_2 \approx \frac{-13.6 \text{ eV} (24-2)^2}{(2)^2} = -1645 \text{ eV}$$

$$E_4 \approx \frac{-13.6 \text{ eV} (24-18)^2}{4^2} = -30.6 \text{ eV}$$

} B. Gauss's Law

$$\text{Energy gained by Auger Electron} = \text{Energy lost by L electron} \\ = -1645 - (-7833) = 6188 \text{ eV}$$