Ex. 8 : $\nu = \frac{c}{\lambda} = 7{,}05.10^{14}$ Hz.

$E = h\nu = \frac{hc}{\lambda} = 2{,}91$ eV

$E_{cc_{max}} = eU_a = 1$ eV $\quad W_0 = E - E_{cc_{max}} = 1{,}91$ eV

$\lambda_0 = \frac{hc}{W_0} = 6492$ Å $\quad \nu_0 = \frac{c}{\lambda_0} = 4{,}6.10^{14}$ Hz.

$n = \frac{\Phi}{e} = 2{,}14.10^{18}$, $\quad n' = \frac{I_s}{e} = 1{,}25.10^{16}$

$\eta = \frac{n'}{n} = 0{,}6\ \%$

Ex. 9 : $\lambda_0 = \frac{hc}{W_0} = 0{,}652\ \mu m.$

$E_{cc} = \frac{hc}{\lambda} - W_0 = 0{,}37$ eV

$E_{cA} \rightarrow E_{cc} = e(V_A - V_c) \Rightarrow E_{cA} = 10{,}37$ eV

$E_{cA} = \frac{1}{2} m_0 v_1^2 \longrightarrow v_1 = \sqrt{\frac{2E_{cA}}{m_0}} = 1{,}9.10^6$ m/s

Ex. 10 tracer $E_{cc} = f(\nu)$

$\lambda_0 \simeq 9.10^{14}$ Hz.

$\frac{\Delta E_{cc}}{\Delta \nu} = h. \longrightarrow h = \frac{E_{cc_2} - E_{cc_1}}{\nu_2 - \nu_1} \simeq 6{,}625.$ 10^{-34} J.s.

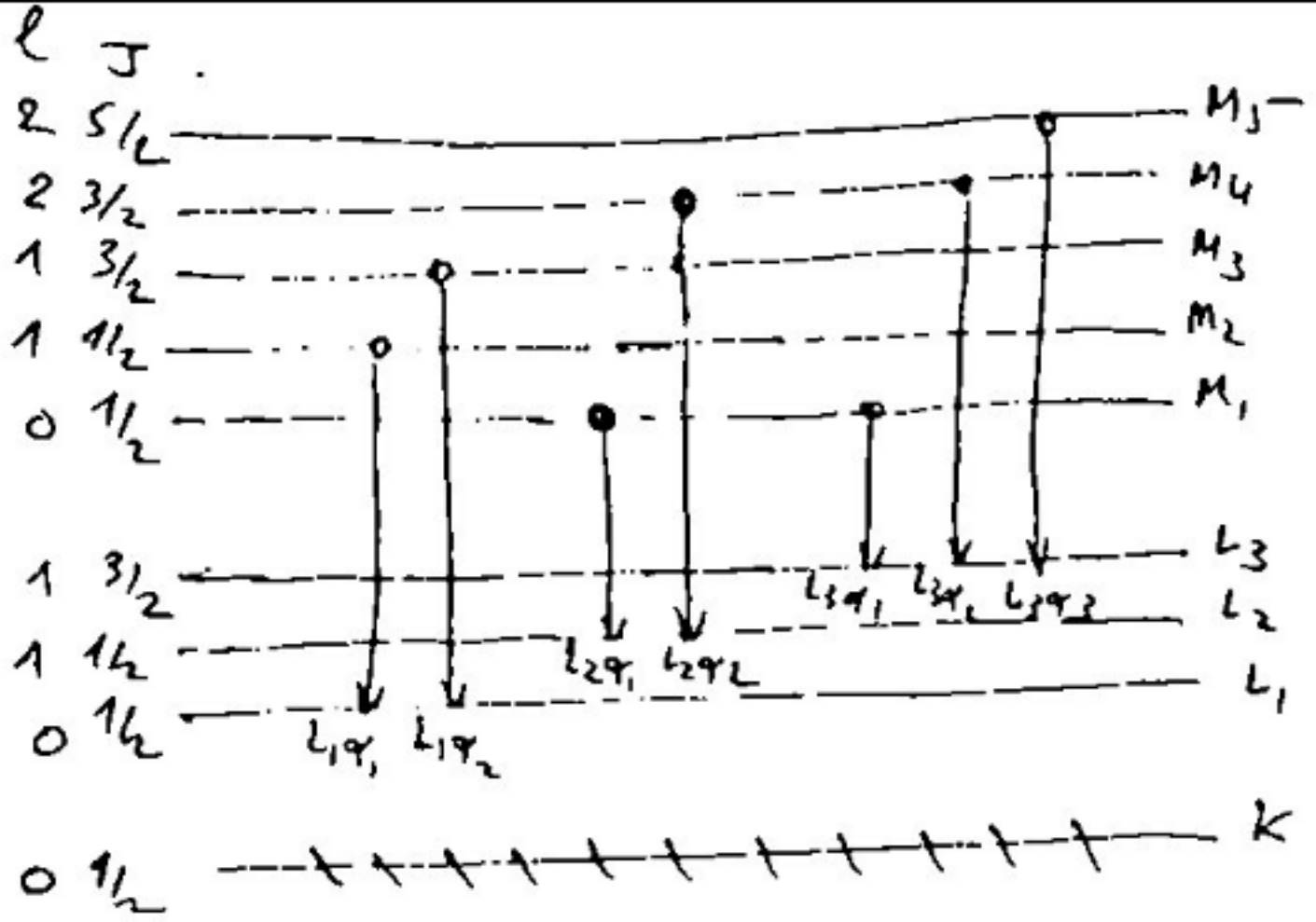
Ex. 11. $E_0 = eU = 16$ keV les électrons

$\Phi = UI = 67{,}2$ W. $\quad P_{ch} = \Phi.r = 6{,}72$ W.

$\Delta\theta = \frac{P_{ch}.\Delta t}{m.c.\ 4{,}18} = 67\ °C.$

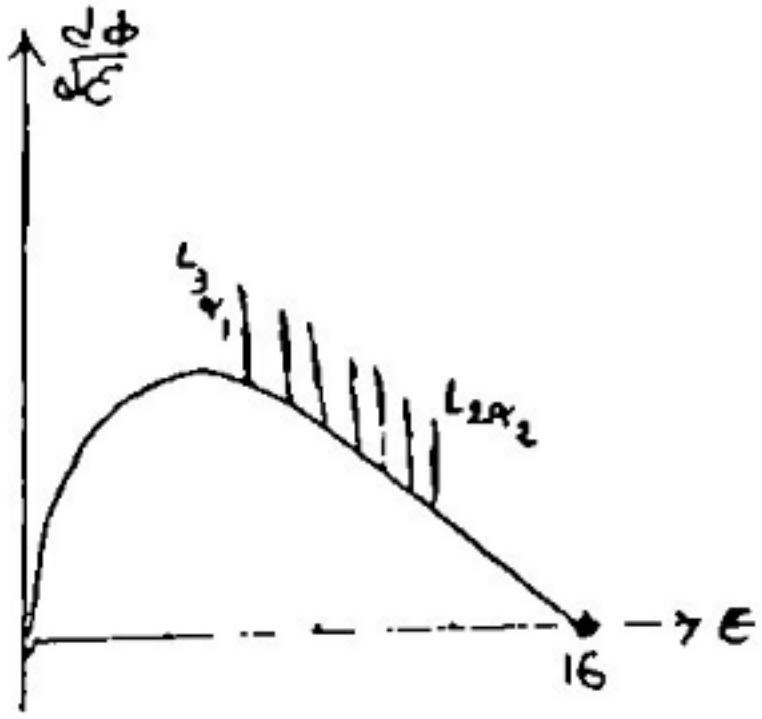
la limite d'un spectre en RX. $E_0 = 16$ keV.

$E_0 < W_K$. $\longrightarrow$ il n'y aura pas de transitions de Series K.



$E_{L_1\alpha_1} = W_{L_1} - W_{M_2} = 10,7$
$E_{L_2\alpha_2} = W_{L_1} - W_{M_3} = 11,2$
$E_{L_2\alpha_1} = W_{L_2} - W_{M_2} = 9,9$
$E_{L_2\alpha_2} = W_{L_2} - W_{M_4} = 11$
$E_{L_3\alpha_1} = W_{L_3} - W_{M_1} = 8,2$
$E_{L_3\alpha_2} = W_{L_3} - W_{M_4} = 9,3$
$E_{L_3\alpha_3} = W_{L_3} - W_{M_5} = 9,4$

keV



la ddp est ramenée à 12,4 KV

$\longrightarrow E_0 = 12,4$ KeV $\quad W_K > W_{L_1} > W_{L_2} > E_0$

les couches K, L_1 et L_2 ne participent pas à l'émission des photons X

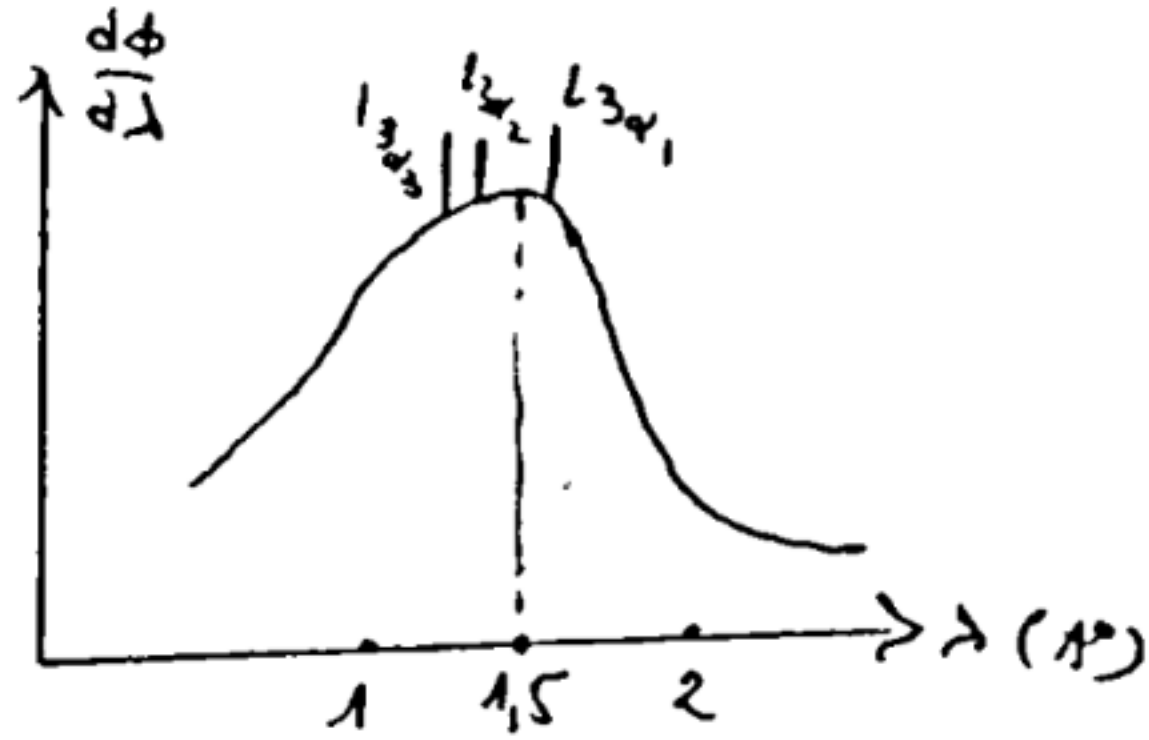
$$\lambda_0 = \frac{hc}{E_0} = \frac{12,4}{12,4} = 1\ \text{Å}.$$

$$\lambda_{moy} = \frac{3}{2}\lambda_0 = 1,5\ \text{Å}.$$

$$\lambda_{L_3\alpha_1} = \frac{12,4}{8,2} = 1,51\ \text{Å}$$

$$\lambda_{L_3\alpha_2} = \frac{12,4}{9,3} = 1,33\ \text{Å}$$

$$\lambda_{L_3\alpha_3} = \frac{12,4}{9,4} = 1,31$$



Ex.12 $\quad E = \frac{5}{2}E_0 \qquad E' = \frac{E_0}{2} \qquad E_C = 2E_0$

$$\cos\theta = 1 - \frac{E_0 E_C}{E E'} = -0,6 \qquad \theta \simeq 127°$$

$E_C = 1$ MeV $\qquad E_T = E_C + E_0 = 3E_0$

$m = 3m_0 \quad \Rightarrow \Delta m = m - m_0 = 2m_0$

$\Delta m = 18,2.10^{-31}$ Kg

$P^2C^2 = E_T^2 - E_0^2 \longrightarrow PC = \sqrt{8}E_0$

$$\sin\varphi = \frac{E'}{PC}\sin\theta = \frac{\frac{E_0}{2}}{\sqrt{8}E_0}\sin\theta$$

$$\sin\varphi = 0{,}141 \qquad \varphi \simeq 8^\circ$$

Ex.13 :

1. $\frac{5}{100} = e^{-\mu_{1\text{cm}}}$

$$\frac{I}{I_0} = e^{-\mu_{3\text{cm}}} = \left(e^{-\mu_{1\text{cm}}}\right)^3$$

$$\frac{I}{I_0} = \left(\frac{5}{100}\right)^3 \qquad A = 1 - \frac{I}{I_0} = 1 - \left(\frac{5}{100}\right)^3$$

$$A = 99{,}98\,\%$$

$$\frac{I'}{I_0} = \frac{1}{2} = e^{-\mu\,\text{CDA}}$$

$$\frac{I''}{I_0} = e^{-\mu\,4\,\text{CDA}} = \left(e^{-\mu\,\text{CDA}}\right)^4$$

$$A'' = 1 - \frac{I''}{I_0} = 1 - \left(\frac{1}{2}\right)^4 = 93{,}75\,\%$$

2. $A'' = 97^\circ \Longrightarrow \frac{I''}{I_0} = 3\,\%$

$$\frac{3}{100} = e^{-\mu\,2{,}6.} \longrightarrow \mu = 1{,}35\ \text{cm}^{-1}$$

$$\text{CDA} = \frac{\ln 2}{\mu.} = \frac{0{,}7}{1{,}35} = 0{,}51.\text{cm}.$$