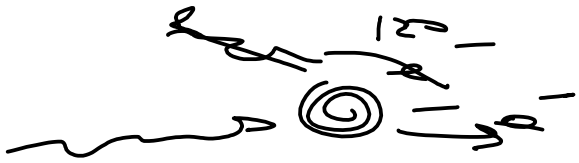
TAREAS

a)



$$\lambda' - \lambda = \frac{h}{mc}(1-\cos\phi) \quad , \quad \lambda = 80\,pm \quad \phi = 120°$$

$$\lambda_c$$

$$\lambda = 83.64\,pm \qquad \lambda' - \lambda = 3.64\,pm$$

b)

$$\frac{h\nu}{c} = \frac{h\nu'}{c}\cos\phi + p\cos\theta$$

$$0 = \frac{h\nu'}{c}\sin\phi - p\sin\theta$$

$$\theta = \tan^{-1}\left(\frac{\nu'\sin\phi}{\nu - \nu'\cos\phi}\right), \quad \nu = \frac{c}{\lambda}$$

$$\theta = 29.26°$$

c) $$KE = hc\left(\frac{1}{\lambda} - \frac{1}{\lambda'}\right) = 674.39\,eV.$$

[2]

$$pc + Mc^2 \geq E$$

$$E^2 = (pc)^2 + (2m + M)c^2)^2$$

$$(pc)^2 + 2pcMc^2 + (Mc^2)^2 \geq (pc)^2 + (2m+M)^2c^4$$

$$2pcMc^2 + (Mc^2)^2 \geq 4m^2c^4 + 4mMc^4 + M^2c^4$$

$$2pcMc^2 \geq 4m^2c^4 + 4mMc^4$$

$$pc \geq \frac{4mMc^4}{2Mc^2}\left(\frac{m}{M} + 1\right)$$

$$pc \geq 2mc^2\left(1 + \frac{m}{M}\right)$$

$$pc = 2mc^2\left(1 + \frac{m}{M}\right)$$

$$pc = 2mc^2 = 1.6396 \times 10^{-13}\ J.$$

$$= 1.022\ MeV.$$