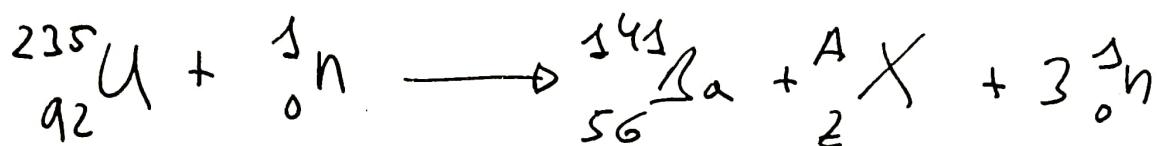


1.-

b) é a correcta. A massa do níquel é menor que as partículas que o constituem.

2.-



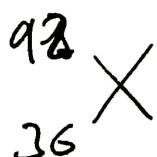
REACTIVOS			PRODUCTOS :		
U	n	Ba	n.	X	
${}^{235}_{92}$	0	${}^{141}_{56}$	0	$92 - 56 = 36$	
${}^{235}_A$	1	141	3	$235 + 1 - [141 + 3 \times 1] =$	

$$\Delta = 92$$

Verdadeira. a b)

a) FALSA é uma reacção de fissão

c) FALSA



$\gamma_{\text{e}} -$

$$N_0 \rightarrow N_0/16$$

$$\ln \frac{N}{N_0} = -\lambda t$$

$$N = N_0/16 \Rightarrow t = 24 \text{ horas}$$

$$t_{1/2} \Rightarrow N = \frac{N_0}{2}$$

$$\lambda = -\frac{\ln N/N_0}{t} = -\frac{\ln \frac{N_0}{16N_0}}{24h} = \frac{2.77}{24h} = 0.116 h^{-1}$$

$$\ln \frac{N}{N_0} = -\lambda t$$

$$t = \frac{\ln N/N_0}{-\lambda}$$

$$t_{1/2} \Rightarrow N = \frac{N_0}{2} ; (t_{1/2} \text{ tiempo de semidesintegración})$$

$$t_{1/2} = \frac{\ln 1/2}{-\lambda} = \underline{\underline{5'97 \text{ horas}}}$$

b) 6h

5o- N_0 : número de nucleos inicial.
 50 años $N_f = \frac{N_0}{2}$

Fai 20 años

$$\ln \frac{N}{N_0} = -\lambda t$$

$$t_{1/2} \rightarrow N = \frac{N_0}{2}$$

$$\lambda = -\frac{\ln \frac{N_0}{2N_0}}{50 \text{ años}} = 6'93 \cdot 10^{-2} \text{ años}^{-1}$$

$$\ln \frac{N}{N_0} = -\lambda t \quad \frac{N}{N_0} = e^{-\lambda t}$$

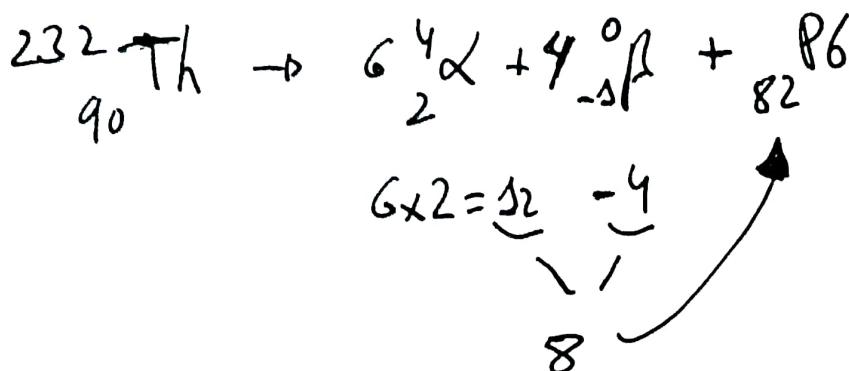
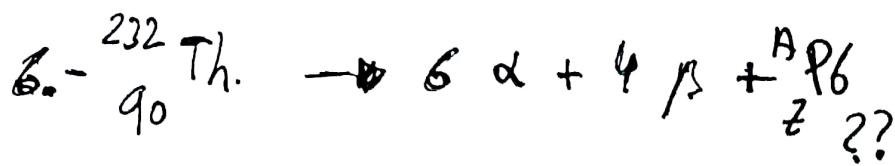
~~$\ln \frac{N_0}{N} = \frac{1}{2} \lambda t$~~ $t = 30 \text{ años}$

$$-\lambda = 6'93 \cdot 10^{-2} \text{ años}^{-1} \cdot 30 \text{ años}$$

$$\frac{N}{N_0} = e^{-\lambda t}$$

$$\frac{N}{N_0} = 0'525 \Rightarrow \frac{N_0}{N} = 8$$

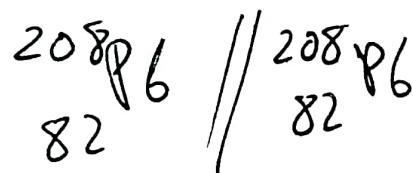
Resposta correta c)



para o número maior

$$6 \times 4 = 24$$

$$222 - 24 = 208$$



Resposta correta a)

7.-



$$t_{1/2} = 28 \text{ años}$$

2 moles de ^{90}Sr ; número de átomos que quedarán después de 112 años?

$$\text{2 moles de } ^{90}\text{Sr} \quad \frac{6'022 \cdot 10^{23} \text{ átomos de } ^{90}\text{Sr}}{1 \text{ mol de } ^{90}\text{Sr}} = 1'2 \cdot 10^{24} \text{ átomos}$$

$$\ln \frac{N}{N_0} = -\lambda t$$

$$\frac{N}{N_0} = e^{-\lambda t} \Rightarrow N = N_0 e^{-\lambda t}$$

λ ? *hai que calcularlo*

$$\ln \frac{N}{N_0} = -\lambda t \Rightarrow \lambda = -\frac{\ln N/N_0}{t} \Rightarrow \lambda = -\frac{\ln 1/2}{28 \text{ años}} =$$

$$\lambda = 2'48 \cdot 10^{-2} \text{ años}^{-1}$$

$$\Rightarrow N = 1'2 \cdot 10^{24} \text{ átomos} \quad e^{-2'48 \cdot 10^{-2} \text{ años}^{-1} \cdot 112 \text{ años}} \Rightarrow$$

$$N = 7'5 \cdot 10^{22} \text{ átomos}$$

$$\frac{N}{N_0} = e^{-\lambda t} \Rightarrow \frac{N}{N_0} = e^{-2'48 \cdot 10^{-2} \text{ años}^{-1} \cdot 112 \text{ años}}$$

$$\frac{N}{N_0} = 0'0625 \Rightarrow \frac{N}{N_0} = \frac{1}{16}$$

8.- O tempo de semi-desintegación é o tempo que leva un núcleo de radioisótopo en converterse na metade $N_0/2$

$$dN = -\lambda N dt \Rightarrow \frac{dN}{dt} = -\lambda \cdot N$$

$$A = \frac{dN}{dt} ; A = -\lambda \cdot N.$$

$$\Rightarrow \frac{dN}{N} = -\lambda dt \text{ integrando}$$

$$\int \frac{dN}{N} = -\lambda dt \Rightarrow [\ln N]_{N_0}^N - \lambda [t]_0^t$$

$$\ln \frac{N}{N_0} = -\lambda t$$

$$N = \frac{N_0}{2} \Rightarrow \ln \frac{1}{2} = -\lambda t_{1/2}$$

tempo de semi-desintegación

A vida media de un núcleo é o tempo que "vive" por promedio un núcleo

$$\bar{\tau} = \frac{1}{\lambda t_{1/2}}$$

9.-

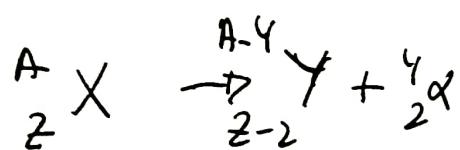
a) Verdaderos

$$A = -\frac{dN}{dt} ; \quad A = \lambda \cdot N$$

b) Non $t_{1/2} = \frac{1}{2}$

c) radiación γ (gamma e radiación electromagnética)

10.-



$$t_{1/2} = 28 \text{ años}$$

$$\ln \frac{N}{N_0} = -\lambda \cdot t \Rightarrow \ln \frac{1}{2} = -\lambda t_{1/2}$$

$$-\lambda = \frac{\ln \frac{1}{2}}{t_{1/2}} \Rightarrow \lambda = -\frac{\ln \frac{1}{2}}{t_{1/2}}$$

$$\lambda = 2'48,70^{-2} \text{ años}^{-1}$$

$$N = 0'75 N_0$$

$$\ln \frac{N}{N_0} = -\lambda \cdot t \Rightarrow t = \frac{\ln \frac{N}{N_0}}{-\lambda} = -\frac{\ln 0'75}{2'48,70^{-2} \text{ años}^{-1}}$$

$$t = 11'6 \text{ años}$$

21.- $^{237}_{94} \text{Pu}$

$$t_{1/2} = 45'7 \text{ días} \Rightarrow N = \frac{N_0}{2}$$

$$\ln \frac{N}{N_0} = -\lambda t$$

\rightarrow constante radioactiva do nucleo

$$\lambda = -\frac{\ln 1/2}{t_{1/2}} ; \lambda = -\frac{\ln 0.5}{45'7 \text{ días}} = 1.52 \cdot 10^{-2} \text{ días}^{-1}$$

$$t = -\frac{\ln N/N_0}{\lambda} = -\frac{\ln \left(\frac{N_0/8}{N_0} \right)}{\lambda} = -\frac{\ln (1/8)}{1.52 \cdot 10^{-2} \text{ días}^{-1}}$$

$$t = 336'8 \text{ días}$$

22

$$t_{1/2} = 80 \text{ días} \quad | \quad m_0 = 200 \text{ g}$$

$$m = 25 \text{ g}$$

$$\ln \frac{N}{N_0} = -\lambda t \quad | \quad t = ?$$

$$\lambda = -\frac{\ln (0.5)}{t_{1/2}} \Rightarrow \lambda = -\frac{\ln (0.5)}{80 \text{ días}} = 0.0693 \text{ días}^{-1}$$

N: numero de nucleos

para pasar a masa a moles, deberíamos hacer los separadores preso)

$$200 \text{ g} \frac{1 \text{ mol}}{2 \text{ g de } {}^{2}X} \frac{2 \text{ g de } {}^{2}X}{1 \text{ mol de } {}^{2}X}$$

Como debiéramos hacer a paso tanto en numerador como en denominador. A relación en número de moles e a misma que en masa

$$\ln \frac{m}{m_0} = -\lambda t \Rightarrow t = -\frac{\ln \frac{m}{m_0}}{\lambda} = -\frac{\ln \frac{25}{200}}{0.693 \text{ días}} =$$

$$t = 20 \text{ días}$$

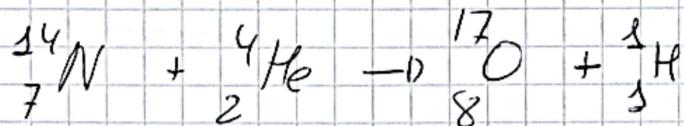
23.-



$$A: 2+3=5 \quad 4$$

NON

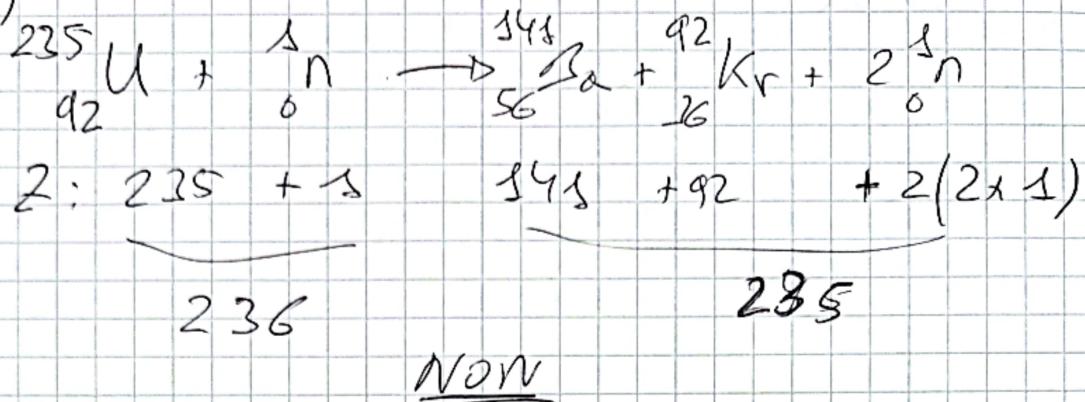
b)



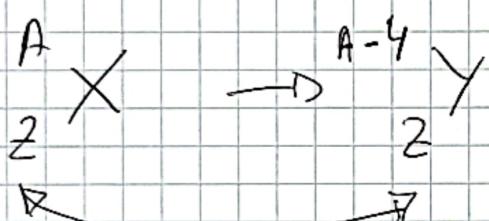
$$A: 14 + 4 \quad 17 \quad 1$$

$$Z \quad 7 + 2 \quad 8 + 1 \quad 1$$

c)



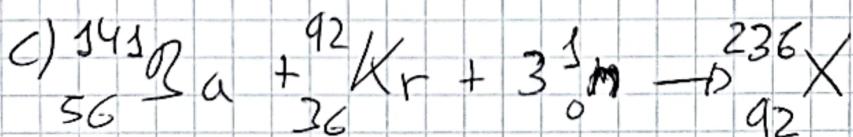
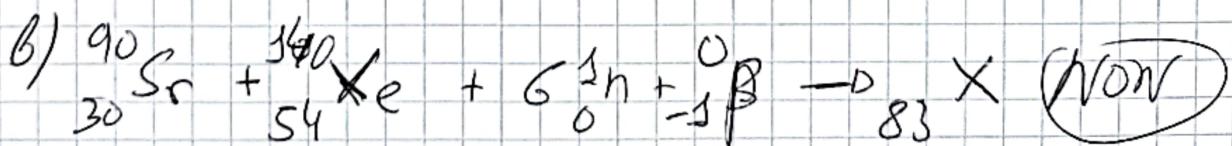
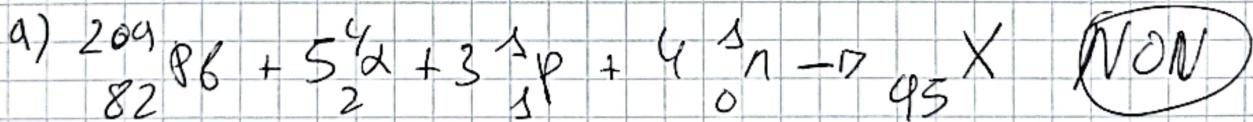
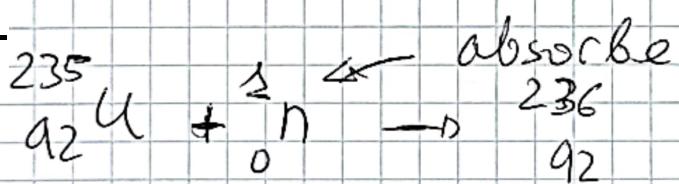
24.-



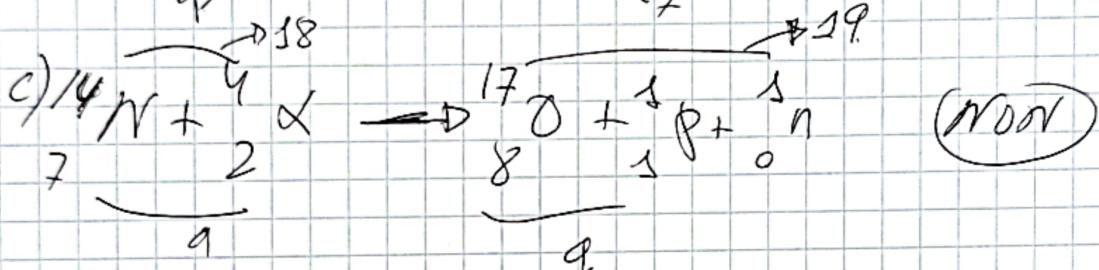
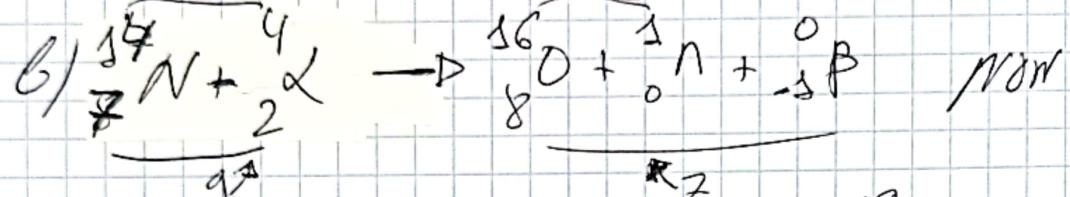
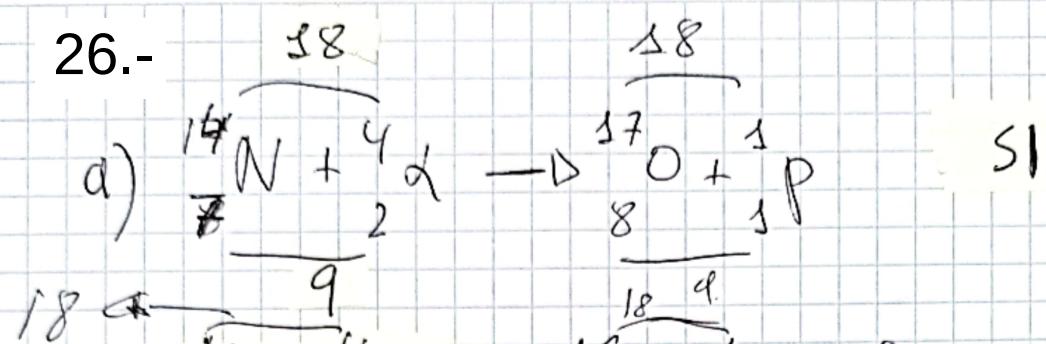
Non VARIA

(C)

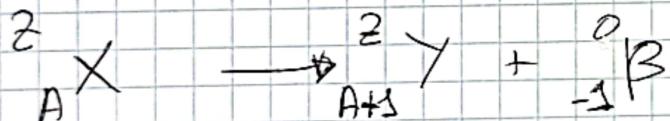
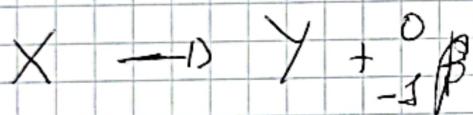
25.-



26.-

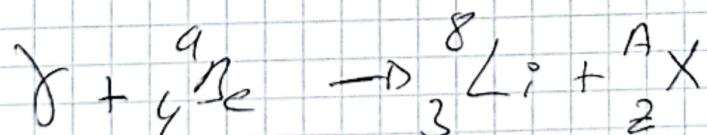


27.-



(a)

28.-

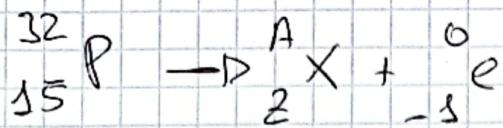


$$\left. \begin{array}{l} Z=1 \\ A=3 \end{array} \right\} \begin{array}{l} \frac{1}{3}n \\ \frac{1}{2}n \end{array}$$

(b)

(b)

29.-

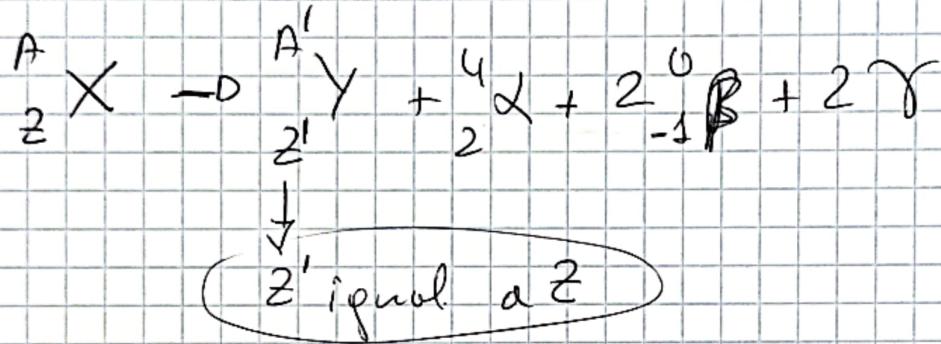


$$Z = 16$$

$$A = 32.$$

(c)

30.-

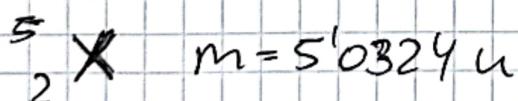


$$A' = A - 4$$

(c)

31.-

Es negativa??



$$2 p^+ \rightarrow 2 \times 1'0072 u = 2'0144$$

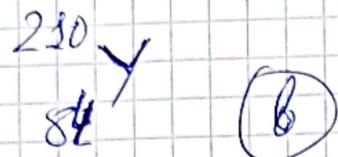
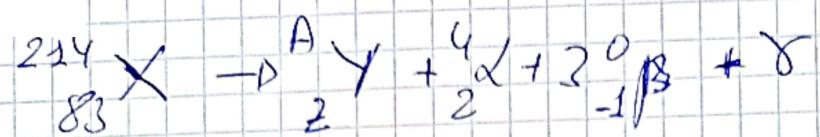
$$3 n^0 \rightarrow 3 \times 1'0086 u = 3'0258$$

$$\hline 5'0402$$

$$\Delta m = (5'0402 - 5'0324) u = 0'078 u = \frac{1'9910^{-10} J}{1 u}$$

$= 1'9910^{-12} J/\text{nucleo}$ ENERGIA POR NUCLEO

32.-



33.-

