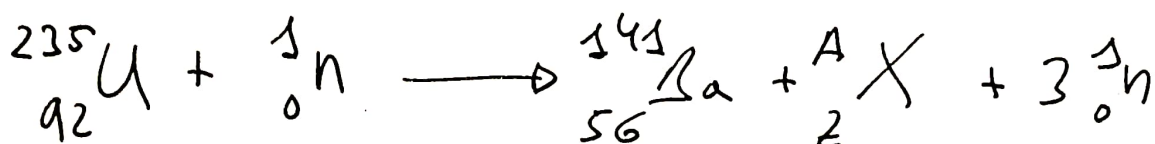


1.-

b) é a correcta. A masa do núcleo é menos que as partículas que o constitúen.

2.-



	REACTIVOS			PRODUCTOS :		
	U	n		Ba	n.	X
Z	92	0		56	0	$92 - 56 = 36$
A	235	1		141	3	$235 + 1 - [141 + 3 \times 1] =$

$\underline{= 92}$

Verdadeira. a b)

a) FALSA é unha reacción de fisión

c) FALSA

$\begin{matrix} 92 \\ 36 \end{matrix} \times$



4.-

$$N_0 \rightarrow N_0/16$$

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

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

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

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

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

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

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

$$t_{1/2} = \frac{\ln 1/2}{-\lambda} = \underline{5.97 \text{ horas}}$$

$$b) \underline{\underline{6h}}$$

5.- N_0 : número de núcleos inicial.
10 anos ~~$N_0 \neq \frac{N_0}{2}$~~ $\frac{N_0}{2}$

Faz 20 anos

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

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

$$\lambda = -\frac{\ln \frac{N_0}{2N_0}}{10 \text{ anos}} = 6.93 \cdot 10^{-2} \text{ anos}^{-1}$$

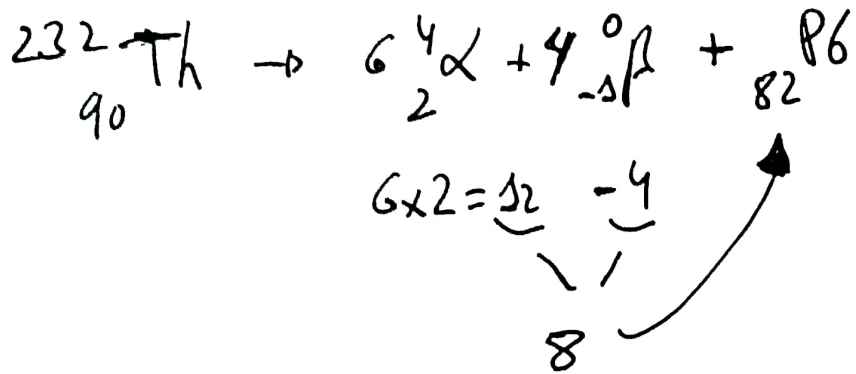
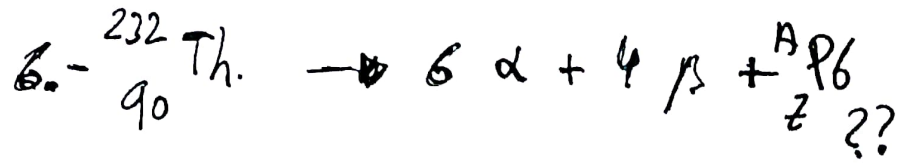
$$\ln \frac{N}{N_0} = -\lambda t \quad \frac{N}{N_0} = e^{-\lambda t}$$

$$\cancel{\ln \frac{N_0}{N}} \quad t = 30 \text{ anos}$$

$$\frac{N}{N_0} = e^{-6.93 \cdot 10^{-2} \text{ anos}^{-1} \cdot 30 \text{ anos}}$$

$$\frac{N}{N_0} = 0.125 \Rightarrow \frac{N_0}{N} = 8$$

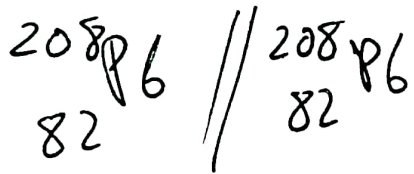
Resposta correta c)



para o número m músicas

$$6 \times 4 = 24.$$

$$222 - 24 = 208$$



Resposta correcta a)

7.- ^{90}Sr

$$t_{1/2} = 28 \text{ anos}$$

2 mols de ^{90}Sr ; número de átomos que
quedaram depois de 112 anos.?

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

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

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

λ ? há que calculá-lo

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

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

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

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

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

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

8.- O tempo de ~~semidesintegração~~ é o tempo que leva um número de núcleos N_0 em converter-se na metade $N_0/2$

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

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

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

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

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

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

tempo de semidesintegração

A vida média de um núcleo é o tempo que "vive" por promedio um núcleo

$$\tau = \frac{1}{\lambda}$$

9.-

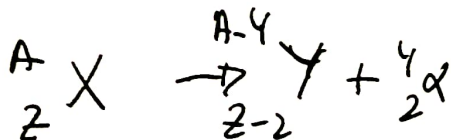
a) Verdadero

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

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

c) radiación γ (gamma e radiación electromagnética)

10.-



$$t_{1/2} = 28 \text{ años}$$

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

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

$$\lambda = 2.48 \cdot 10^{-2} \text{ años}^{-1}$$

$$N = 0.75 N_0$$

$$\ln \frac{N}{N_0} = -\lambda \cdot t \Rightarrow t = \frac{\ln N/N_0}{-\lambda} = -\frac{\ln 0.75}{2.48 \cdot 10^{-2} \text{ años}^{-1}}$$

$$t = 11.6 \text{ años}$$

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

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

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

λ constante radioactiva do nucleo

$$\lambda = -\frac{\ln 1/2}{t_{1/2}} ; \lambda = -\frac{\ln 0'5}{45'7 \text{ dias}} = 1'52 \cdot 10^{-2} \text{ dias}^{-1}$$

$$t = -\frac{\ln N/N_0}{\lambda} = -\frac{\ln \left(\frac{N_0/8}{N_0} \right)}{\lambda} = -\frac{\ln(1/8)}{1'52 \cdot 10^{-2} \text{ dias}^{-1}}$$

$$t = 336'8 \text{ dias}$$

22

$$t_{1/2} = 10 \text{ dias}$$

$$m_0 = 200 \text{ g}$$

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

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

$$t = ?$$

$$\lambda = -\frac{\ln(0'5)}{t_{1/2}} \Rightarrow \lambda = -\frac{\ln(0'5)}{10 \text{ dias}} = 0'0693 \text{ dias}^{-1}$$

N : número de núcleos

para pasar a masa a nucleos, deberiamos
 hacer el siguiente paso:

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

como deberiamos hacer el paso tanto en
 numerador como en denominador. La relación
 en número de moles es la misma que en
 masa

$$\ln \frac{m}{m_0} = -\lambda t \Rightarrow t = -\frac{\ln \frac{m}{m_0}}{\lambda} = -\frac{\ln \frac{25}{200}}{0.0693 \text{ días}^{-1}}$$

$$t = 30 \text{ días}$$

23.-



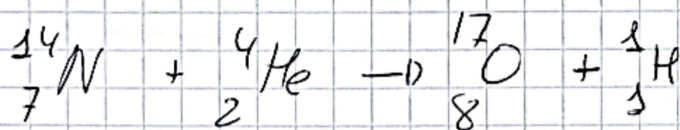
A

$$2+3=5$$

4

NO N

b)



A: 14

+ 4

17

1

Z

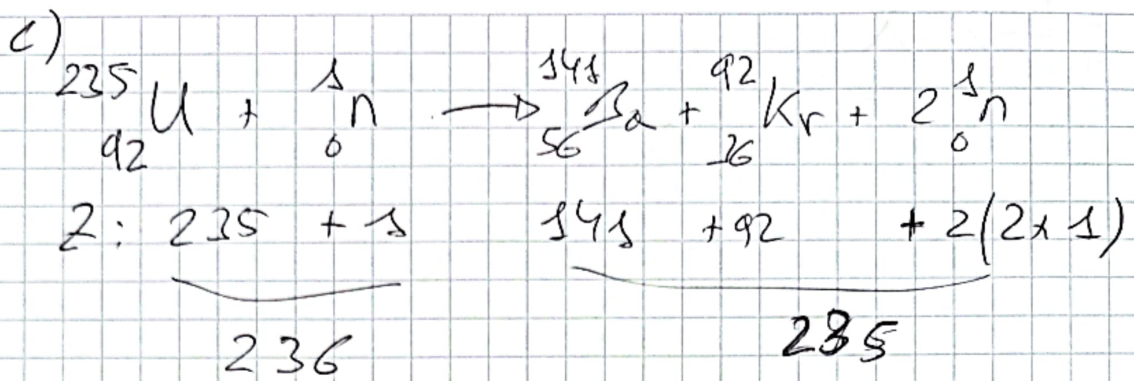
7

+ 2

8

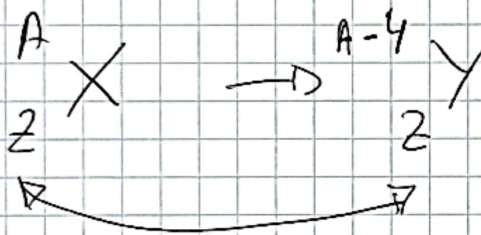
+ 1

55



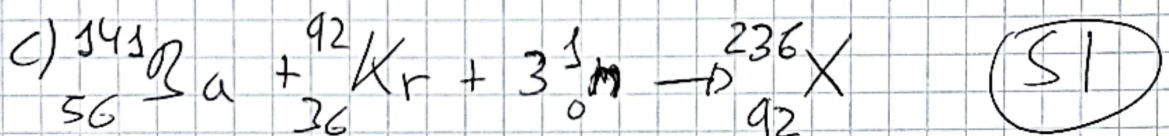
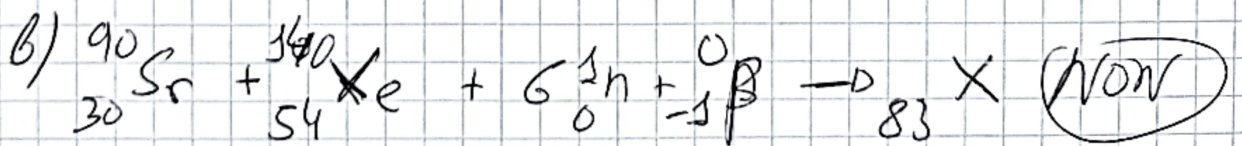
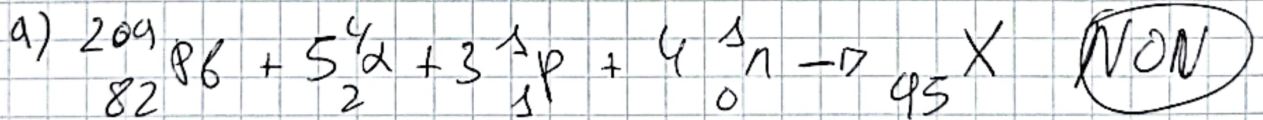
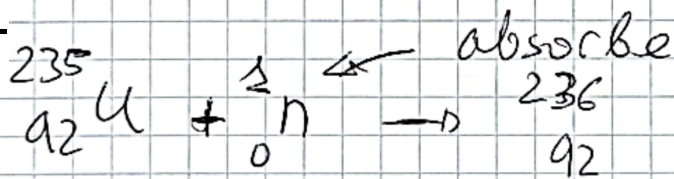
NON

24.-

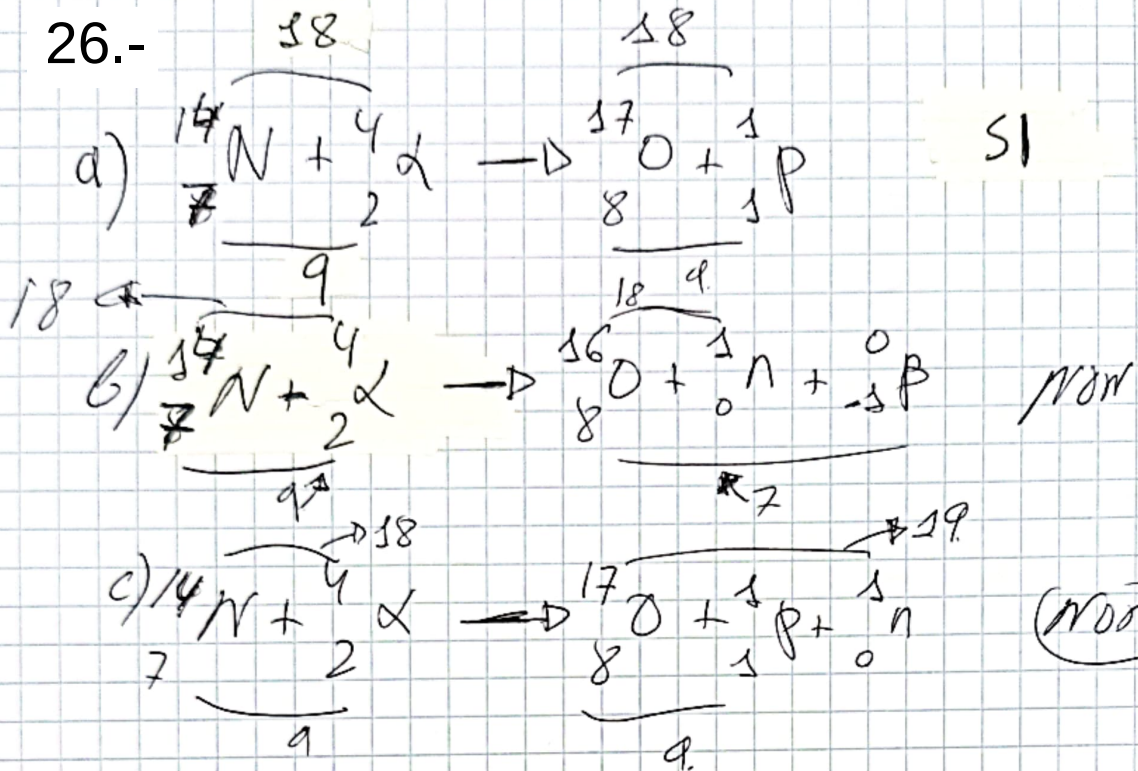


NON VARIA (C)

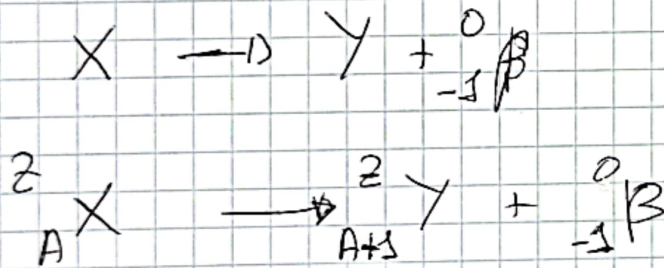
25.-



26.-

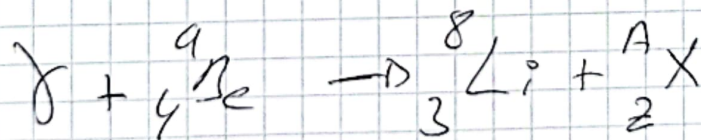


27.-



a)

28.-

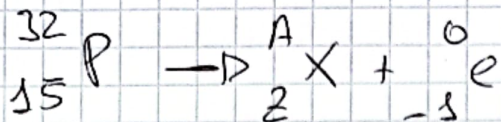


$\left. \begin{array}{l} Z=1 \\ A=3 \end{array} \right\} \begin{array}{l} 1 \\ 1 \end{array} \text{n}$

b)

b)

29.-

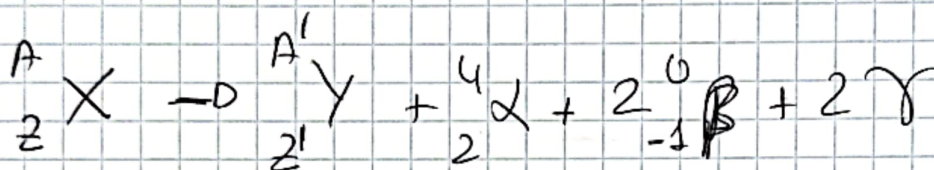


$$Z = 16$$

$$A = 32$$

(C)

30.-



\downarrow
 Z' igual a Z

$$A' = A = 4$$

(C)

31.-

É negativa??

$${}_2^5X \quad m = 5.0324 \text{ u}$$

$$2 \text{ p}^+ \rightarrow 2 \times 1.0072 \text{ u} = 2.0144$$

$$3 \text{ n}^0 \rightarrow 3 \times 1.0086 \text{ u} = 3.0258$$

$$\underline{5.0402}$$

$$\Delta m = (5.0402 - 5.0324) \text{ u} = 0.0078 \text{ u} \quad \frac{1.49 \cdot 10^{-10} \text{ J}}{1 \text{ u}} =$$

$$= 1.162 \cdot 10^{-12} \text{ J/nucleo} \quad \underline{\text{ENERGIA POR NÚCLEO}}$$

32.-

$${}_{83}^{214}\text{X} \rightarrow {}_2^A\text{Y} + {}_2^4\alpha + {}_{-1}^0\beta + \gamma$$

$${}_{84}^{210}\text{Y}$$

(6)

33.-

$${}_{11}^A\text{P} \rightarrow {}_{-1}^0\beta + {}_{11}^A\text{n} + \bar{\nu}_e$$