

Examen Repêchage Septembre 2018

I Le spectrographe de masse

3) $R_{39} = 28,43 \text{ cm}$

4) c) $A = 41$

II Oscillateur mécanique non amorti

2) $m_A = 62,7 \text{ kg}$

$k = 607 \text{ N/m}$

III Ondes Progressives

B 1) a) $\lambda = 0,64 \text{ m}$

b) $y_S(t) = 0,03 \sin(50 \pi t + \pi/2)$ en m si t en s

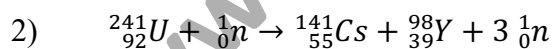
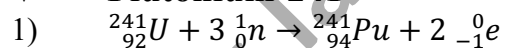
2) M et S en opposition de phase car $\Delta x = 5 \lambda/2$

IV Relativité restreinte

2) calcul classique : $v = 1,08 c = 3,23 \cdot 10^8 \text{ m/s}$ (impossible car $v > c$)

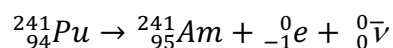
Calcul relativiste : $v = 2,3223 \cdot 10^8 \text{ m/s} < c < v_{\text{classique}}$

V Plutonium-241



$\Delta m_F = 0,2936 \text{ u}$

$E_F = 273 \text{ MeV}$



$\Delta m_D = 2,142 \cdot 10^{-5} \text{ u}$

$E_D = 0,020 \text{ MeV}$

3) $E_D/E_F = 8,2 \cdot 10^{-5} \ll 1$

5) $T = 13 \text{ y}$