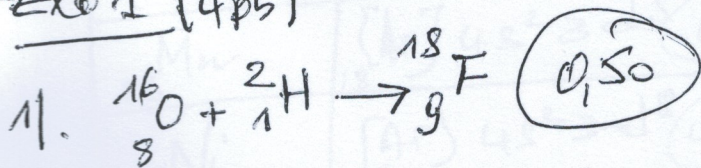


Exo 1 (4pts)



(0,50)  $N_t = N_0 e^{-\lambda t} \Rightarrow L_n \frac{N_0}{N_t} = \lambda t \Rightarrow \lambda = \frac{1}{t} L_n \frac{N_0}{N_t}$   
 $N_0 = 100\%$  ;  $N_t = 10\%$   $\Rightarrow \lambda = 6,3 \cdot 10^{-3} \text{ min}^{-1}$  (0,50)

(0,50)  $T = \frac{L_n 2}{\lambda} \Rightarrow T = 110 \text{ min}$  (0,50)

2)  $\Delta E = -\Delta m c^2$   $\Delta m = \left( m_{\text{O}} + m_{\text{H}} \right) - \left( m_{\text{F}} + m_{\text{He}} \right) < 0$   
 $\Delta m < 0 \Rightarrow \Delta E < 0 \Rightarrow$  La réaction dégage de l'énergie (0,50)

Exo 2 (6pts)

1) - La formule de l'ion hydrogénoïde de Be est  ${}^4\text{Be}^{3+}$  (0,50)

2)  $r_n = a_0 \frac{n^2}{Z}$  ( $n=1$ ;  $Z=4$ )  $\Rightarrow r_1 = 0,13 \text{ \AA}$  (0,50)

2)  $m v_n r_n = \frac{n h}{2\pi} \Rightarrow v_1 = 8,73 \cdot 10^6 \text{ m/s}$  (0,50)

3)  $\lambda = \frac{h}{m v} \Rightarrow \lambda = 0,83 \text{ \AA}$  (0,50)

4) -  $\lambda_{\min} = \Delta E_{\max}$  (0,50)

$\Delta E = \frac{hc}{\lambda_{1-\infty}}$  ;  $\frac{1}{\lambda_{\min}} = R_H Z^2 \left( \frac{1}{\infty} - \frac{1}{1} \right)$  (0,50)

$\Rightarrow \lambda_{\min} = 5,7 \cdot 10^{-9} \text{ m}$  (0,50)

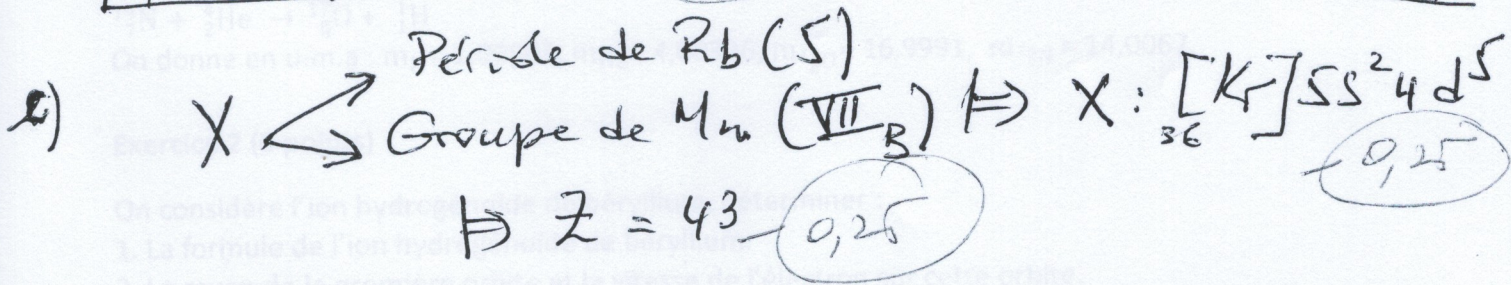
5) -  $\Delta E = \frac{hc}{\lambda_{1-2}}$  ;  $\frac{1}{\lambda_{\max}} = R_H Z^2 \left( \frac{1}{4} - \frac{1}{1} \right)$  (0,50)

$\Rightarrow \lambda_{\max} = 7,6 \cdot 10^{-9} \text{ m}$  (0,50)



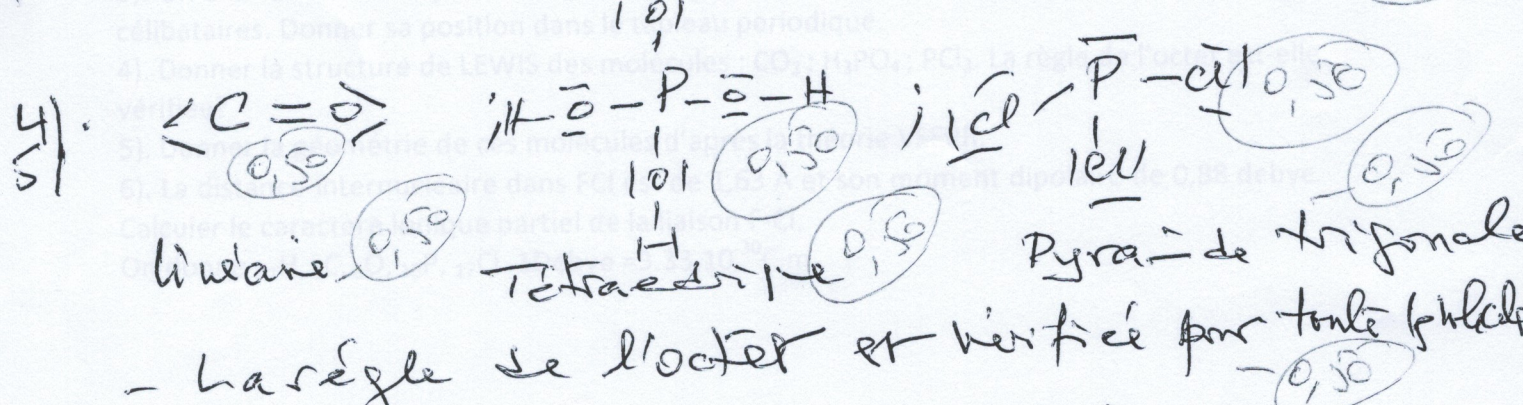
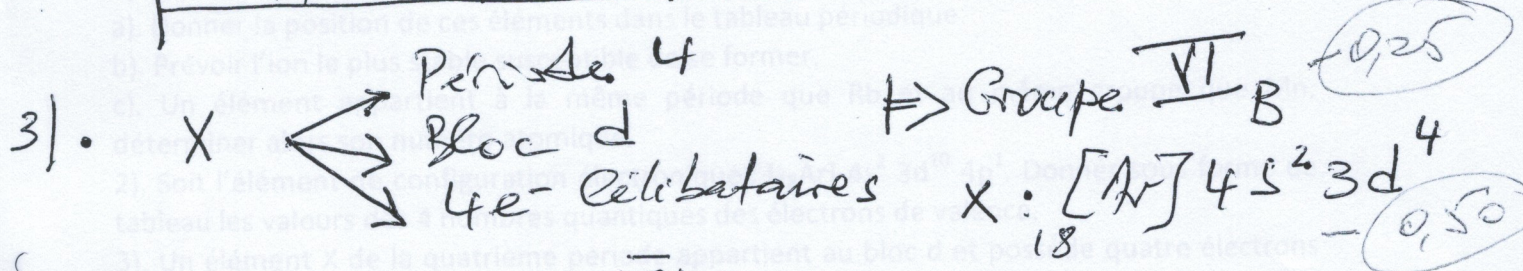
03 (10 pts)

éléments	Structure électronique	Période	Gpe	ion stable
$^{25}\text{Mn}$	$[\text{Ar}] 4s^2 3d^5$	4	VII <sub>B</sub>	$\text{Mn}^{2+}$
$^{28}\text{Ni}$	$[\text{Ar}] 4s^2 3d^8$	4	VIII <sub>B</sub>	$\text{Ni}^{2+}$
$^{37}\text{Rb}$	$[\text{Kr}] 5s^1$	5	IA	$\text{Rb}^+$
$^{47}\text{Ag}$	$[\text{Kr}] 5s^1 4d^{10}$	5	IB	$\text{Ag}^+$



3)

$e^-$	$n$	$l$	$m$	$s$
$4s^1$	4	0	0	+1/2
$4s^2$	4	0	0	-1/2
$4p^1$	4	1	-1	+1/2



6)  $X_{\text{F-cl}} = \frac{M_{\text{exp}}}{M_{\text{th}}} \cdot 100$  ;  $M_{\text{F-cl}} = 8 \cdot d_{\text{F-cl}}$   
 $\Rightarrow S = M_{\text{F-cl}} / d_{\text{F-cl}} = 1,80 \cdot 10^{-20}$   
 $\Rightarrow X_{\text{F-cl}} = \frac{8}{e} \cdot 100 = 11\% \Rightarrow$  La liaison est plus...