

Application dirigée du cours

Ex 1

1. possible $\rightarrow 4s$
2. impossible $l \leq n-1$
3. impossible $n \geq 1$
4. impossible $l \geq m \geq -l$

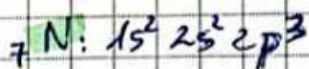
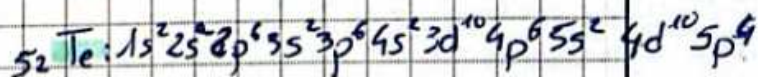
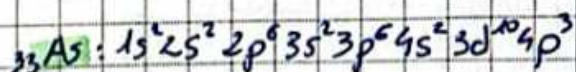
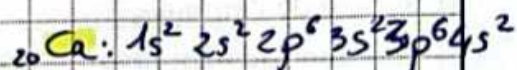
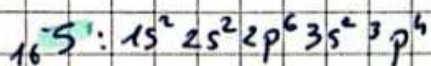
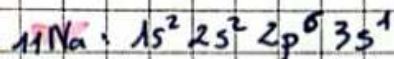
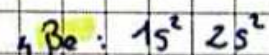
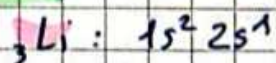
Ex 2

e⁻ de cœure⁻ de valence

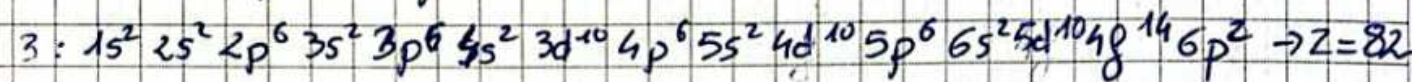
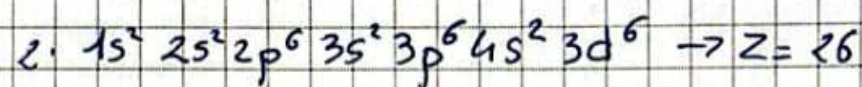
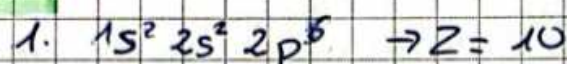
1. ${}_{7}N: 1s^2 2s^2 2p^3$
2. ${}_{8}O: 1s^2 2s^2 2p^4$
3. ${}_{15}P: 1s^2 2s^2 2p^6 3s^2 3p^3$
4. ${}_{23}V: 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^3$
5. ${}_{23}V^{4+}: 1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$
6. ${}_{27}Co: 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^7$
7. ${}_{27}Co^{2+}: 1s^2 2s^2 2p^6 3s^2 3p^6 3d^7$
8. ${}_{40}Zn: 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^2$
9. ${}_{40}Zn^{2+}: 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 4d^2$
10. ${}_{55}I: 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^5$
11. ${}_{55}I^{-}: 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6$
12. ${}_{63}Eu: 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^7$

EX 3.									
G ↑		E ↑		E ↑		E ↑		E ↑	
3d	↑	3d	↑	3d	↑	3d	↑	3d	↑
4s	↑	4s	↑	4s	↑	4s	↑	4s	↑
3p	↑	3p	↑	3p	↑	3p	↑	3p	↑
3s	↑	3s	↑	3s	↑	3s	↑	3s	↑
2p	↑	2p	↑	2p	↑	2p	↑	2p	↑
2s	↑	2s	↑	2s	↑	2s	↑	2s	↑
1s	↑	1s	↑	1s	↑	1s	↑	1s	↑
${}_{5}B$ 1e ⁻ célib.		${}_{17}Cl^{-}$ 0e ⁻ célib.		${}_{25}Mn$ 5e ⁻ célib.		${}_{30}Zn$ 0e ⁻ célib.		N° .../...	

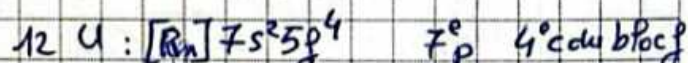
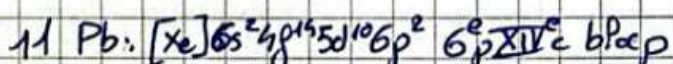
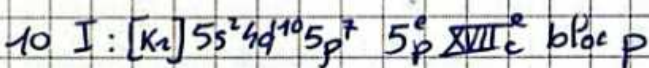
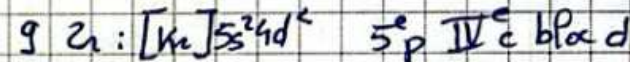
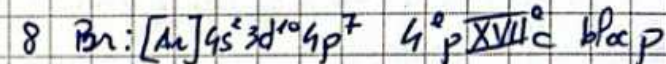
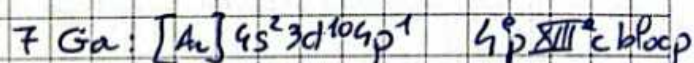
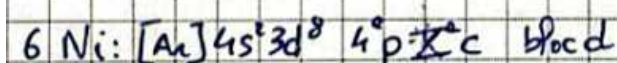
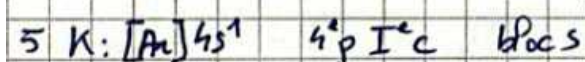
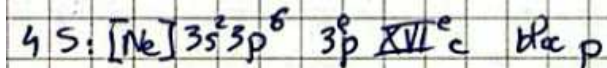
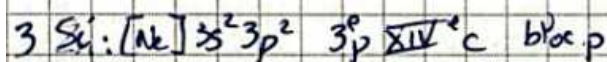
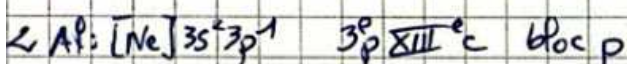
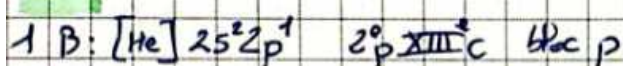
EX4



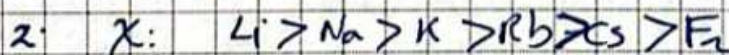
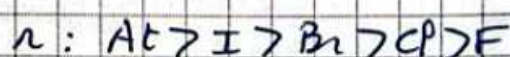
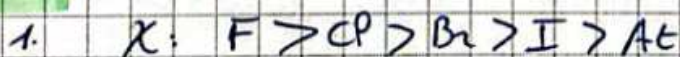
EX5



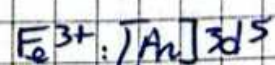
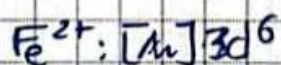
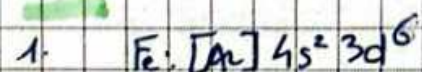
EX6



EX7



EX8



↓ moins d'e⁻ donc ↓ de moins en moins d'écrantage

140 pm

76 pm

64 pm

S'entraîner

Ex 1.

1. Pa b avec $3p^8$, $4s^5$ et avec Pa m config (n, l, m_l, m_s)
2. C'est la config c avec $4e^-$ célibataires
3. Pa config a où $3p$ et $3d$ sont pleines
4. $c < a < d$ orbitales excitées
5. $Ni^{2+}: 1s^2 2s^2 2p^6 3s^2 3p^6 3d^8$

Ex 2.

1. Les sous couches se remplissent par valeur $n+l$ croissantes
2. Cr: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^4$ Hf: $[Kr] 5s^2 4d^4$
 Ag: $[Kr] 5s^2 4d^9$ Au: $[Xe] 6s^2 4f^{14} 5d^9$
3. Cr: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^5$ Mo: $[Kr] 5s^1 4d^5$
 Ag: $[Kr] 5s^1 4d^{10}$ Au: $[Xe] 6s^1 4f^{14} 5d^{10}$
4. Gd: $[Xe] 6s^2 4f^7 5d^1$ au lieu de $[Xe] 6s^2 4f^8$

Ex 3.

1.
$$\begin{cases} x + y = 1 \\ x \times 63 + y \times 65 = 63,5 \end{cases} \Rightarrow \begin{aligned} x &= 0,75 \\ y &= 0,25 \end{aligned}$$
2. structure de Xe + $4s^1$ et $3d^{10}$ pas structure attendue mais couche d + stable si pleine

Ex 4.

1. $V: [Ar] 4s^2 3d^3$ $Cr: [Ar] 4s^2 3d^4$ $As: [Ar] 4s^2 3d^{10} 4p^3$
2. $As \rightarrow (4, 1, -1; 1/2); (4, 1, 0, 1/2); (4, 1, 1, 1/2)$
3. $V^{3+}: [Ar] 4s^2$ ou $V^{5+}: [Ar]$

Ex 5.

1. 1^{re} colonne, O au dessus de S
2. O^{2-} S^{2-}
3. $r_1 \rightarrow O^{2-}$ $r_2 \rightarrow S^{2-}$

Ex 6.

1. $K^+; Ca^{2+}; Sc^{3+}; S^{2-}; Cl^-$
2. $S^{2-} > Cl^- > K^+ > Ca^{2+} > Sc^{3+}$ pour r
car ts ont même e^- mais noyaux différents
plus le noyau est chargé, plus il y a contraction