a.) $A(aq) \longrightarrow B(aq)$

$t_{1/2}$ A = 333 s

[A] après 111 s = 0.222 M

Quelle sera la concentration de A après un autre 111s.

$$t_{1/2} = \frac{\ln 2}{k} \iff k = \frac{\ln 2}{t_{1/2}}$$

$$k = \frac{\ln 2}{333} = 2.08 \times 10^{-3}$$

$$[A] = [A]_0 e^{-kt}$$

$$[A] = 0.222\, e^{-(2.08\times10^{-3}) \times 111}$$

$$\boxed{[A] = 0.176\ M}$$

b.) $2A(aq) \longrightarrow B(aq) + C(aq)$

$[A]_0 = x$ T = 25° → 50°

$[A] = 3x$ V = 27 plus vite

$$27 = 3x^2$$

$$x^2 = \frac{27}{3}$$

$$x = \sqrt{\frac{27}{3}} \qquad x = 3$$

$[A]_0 = 3M$

$[A] = 9M$

$$\ln \frac{K_2}{K_1} = -\frac{E_a}{R}\left(\frac{1}{T_2} - \frac{1}{T_1}\right)$$

[redacted] ② [redacted] 66

(a) $K_f = 2.0 \times 10^{43}$

0.0444 mol de $Fe(NO_3)_3$ $V = 1\,L$

$[NaCN] = 0.777$ $V = 1\,L$

	$Fe^{3+}(aq)$	+ $6\,CN^-(aq)$	⇌	$Fe(CN)_6^{3-}(aq)$
i	0.0444	0.777		—
c	−0.0444	−6(0.0444)		+0.0444
e	—	0.5106		0.0444

$\boxed{[CN^-] = 0.5106\ M}$

$\boxed{[Fe(CN)_6^{3-}] = 0.0444\ M}$

$$K_f = \frac{[Fe(CN)_6^{3-}]}{[Fe^{3+}][CN^-]^6} \Rightarrow [Fe^{3+}] = \frac{[Fe(CN)_6^{3-}]}{K_f\,[CN^-]^6}$$

$$[Fe^{3+}] = \frac{0.0444}{2.0 \times 10^{43} \times (0.5106)^6}$$

$\boxed{[Fe^{3+}] = 1.25 \times 10^{-43}\ M}$

b.) $Mg_3(PO_4)_2 \rightleftharpoons 3\,Mg^{2+} + 2\,PO_4^{3-}$

$K_s = [Mg^{2+}]^3 [PO_4^{3-}]^2$

$1.0 \times 10^{-24} = x^3 \cdot x^2$

$x^5 = 1.0 \times 10^{-24}$

$x = \sqrt[5]{1.0 \times 10^{-24}}$

$x = 1.58 \times 10^{-5}\ mol/L \times 262.86\ g/mol = \boxed{4.15 \times 10^{-3}\ g/L}$

a) $[NaA] = 0.222\ M$ $V = 3\ L$

$[HCl] = 0.111\ M$ $V = 1\ L$

$pH = 4.44$

$$A^-_{(aq)} + H^+_{(aq)} \rightleftharpoons HA_{(aq)}$$

	$A^-_{(aq)}$	$H^+_{(aq)}$	$HA_{(aq)}$
i	0.666	0.111	—
c	−0.111	−0.111	+0.111
e	0.555	—	0.111

$$pH = pKa + \log \frac{[A^-]}{[HA]}$$

$$pKa = pH - \log \frac{[A^-]}{[HA]} \Rightarrow pKa = 4.44 - \log \frac{0.555}{0.111}$$

$$pKa = 3.74$$

$$Ka = 10^{-3.74} \Rightarrow \boxed{Ka = 1.82 \times 10^{-4}}$$

b) $Ka = 5.5 \times 10^{-5}$ $V = 3\ L$

$[HA] = 0.333\ M$ $[NaA] = 0.222\ M$

pH avant l'ajout du NaOH

$$pH = -\log(5.5 \times 10^{-5}) + \log\left(\frac{0.222}{0.333}\right)$$

$$\boxed{pH = 4.08}$$

pH après l'ajout du NaOH

$$HA + NaOH \rightleftharpoons A^- + H_2O$$

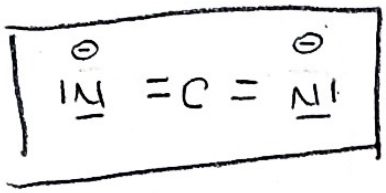
	HA	$NaOH$	A^-
i	0.999	0.200	0.666
c	−0.200	−0.200	+0.200
e	0.799	—	0.866

$$pH = -\log(5.5 \times 10^{-5}) + \log\left(\frac{0.866}{0.799}\right)$$

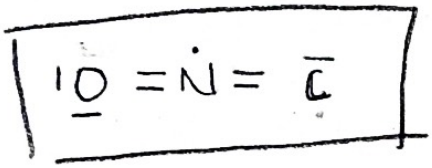
$$\boxed{pH = 4.29}$$

[redacted] (4) [redacted]

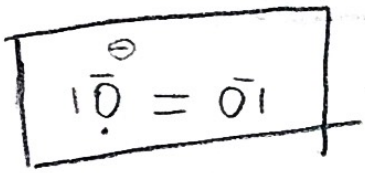
1.) NCN^{2-} $5 + 4 + 5 + 2 = 16$



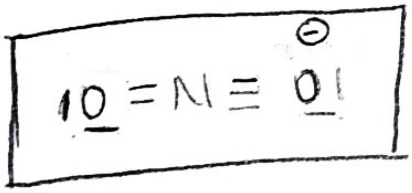
2.) ONC $6 + 5 + 4 = 15$



3.) O_2^- $2 \times 6 + 1 = 13$

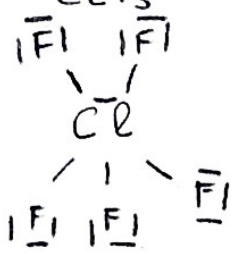


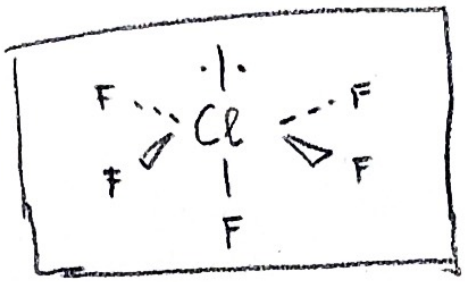
4.) NO_2^- $5 + (2 \times 6) + 1 = 18$



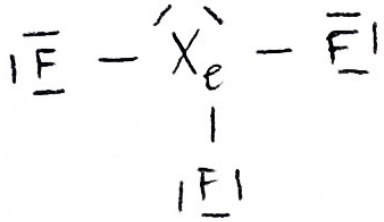
5.) +2

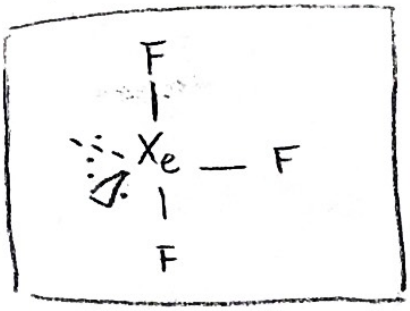
6.) ClF_5 $(7 \times 5) + 7 = 42$



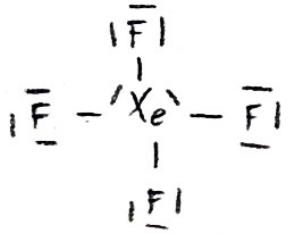


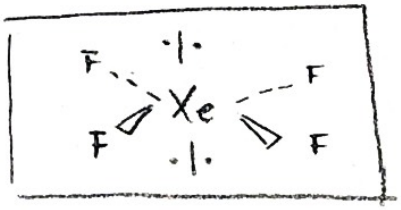
7.) XeF_3^+ $8 + (3 \times 7) - 1 = 28$



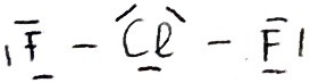


8.) XeF_4 $8 + (4 \times 7) = 36$



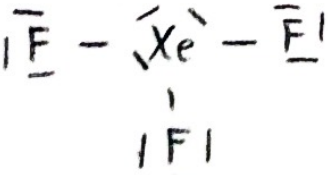


9.) ClF_2^- $7 + (2 \times 7) + 1 = 22$



$\Rightarrow$ Hybridation sp^3d

10.) XeF_3^- $8 + (3 \times 7) + 1 = 30$



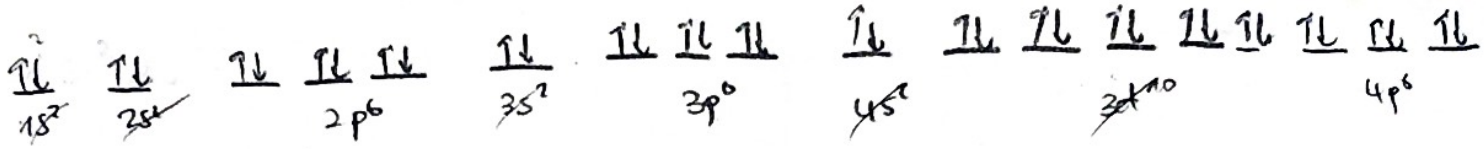
$\Rightarrow$ Hybridation sp^3d^2

11.) $Zn = 30$

$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}$ $\quad m = -1$ et $s = +1/2$

Réponse : 3

12) Br^- 36 $\quad l = 1$ et $m = -1$

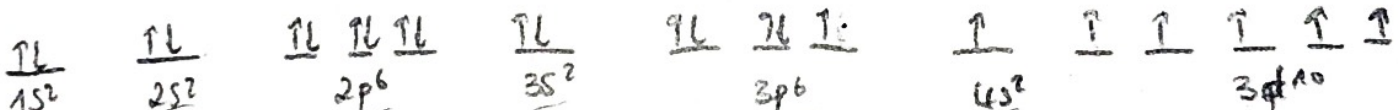


Réponse : 6

13) Br^- $\quad m = 0$

Réponse : 16

14) Co^{4+} $\quad 27 - 4 = 23$ $\quad m = +2$



Réponse : 1

15.) Zn^{2+} 28 $\quad m = 0$ et $s = -1/2$

Réponse : 7

16.) Cl, K, Br, Rb

14.) $K^+ = 18$

$\underline{\uparrow\downarrow}_{1s^2}$ $\underline{\uparrow\downarrow}_{2s^2}$ $\underline{\uparrow\downarrow}\ \underline{\uparrow\downarrow}\ \underline{\uparrow\downarrow}_{2p^6}$ $\underline{\uparrow\downarrow}_{3s^2}$ $\underline{\uparrow\downarrow}\ \underline{\uparrow\downarrow}\ \underline{\uparrow\downarrow}_{3p^6}$

$Z = 19$ $\sigma = 10$ $Z_{eff} = 19 - 10$

$\boxed{Z_{eff} = +9}$

18.) Br^-

19.) Ca^{2+}

20.) Bohr