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$$a) t_{1/2} = \frac{\ln 2}{k} \Rightarrow k = \frac{\ln 2}{t_{1/2}} = \frac{\ln 2}{333} = 0.002082$$

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

$$[A]_0 = \frac{0.222}{e^{-(0.002082)(111)}} = \underline{\underline{0.280 M}}$$

$$[A]_{222} = [A]_0 e^{-kt} = (0.280) e^{-(0.002082)(222)} = \underline{\underline{0.176 M}}$$

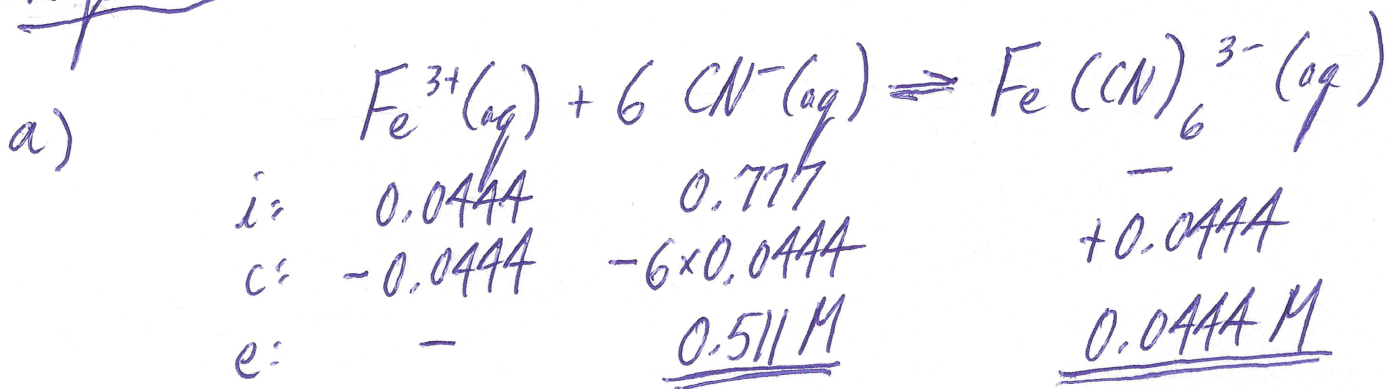
b) l'effet concentration est responsable pour une augmentation de vitesse par un facteur de 3 \Rightarrow l'effet température est donc responsable pour un facteur de $27.0/3 = 9.00$

$$\Rightarrow \frac{k_{50}}{k_{25}} = 9.00$$

$$\ln(k_2/k_1) = -\frac{E_a}{R} \left(\frac{1}{T_2} - \frac{1}{T_1} \right) \Rightarrow E_a = \frac{-R \ln(k_2/k_1)}{(1/T_2 - 1/T_1)}$$

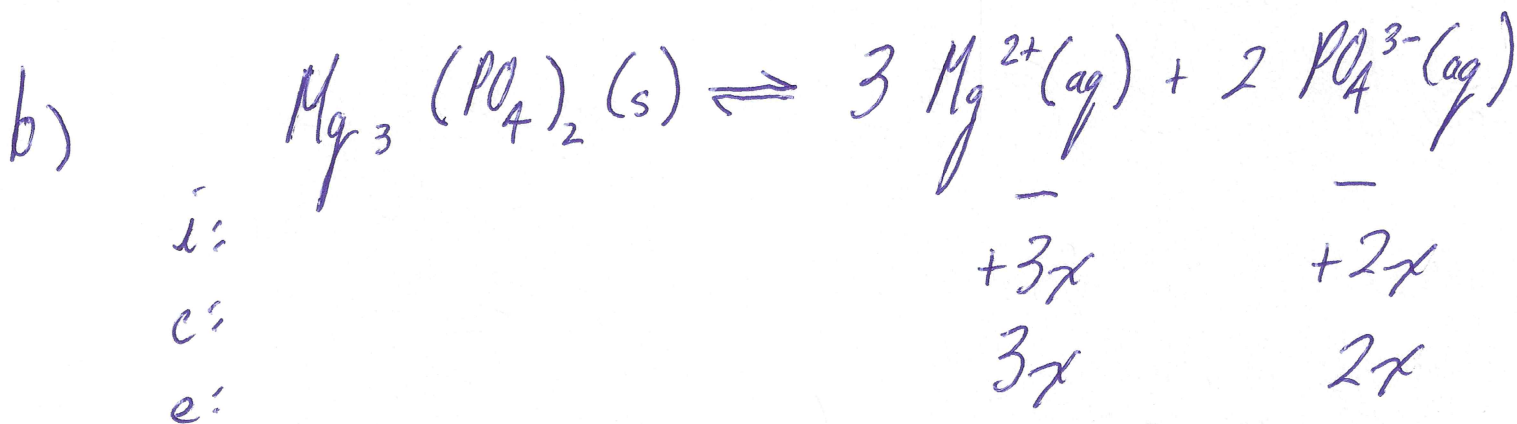
$$E_a = \frac{-8.3145 \ln(9.00)}{(1/323.15 - 1/298.15)} = 70406 \text{ J} = \underline{\underline{+70.4 \text{ kJ}}}$$

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$$2.0 \times 10^{43} = \frac{[\text{Fe}(\text{CN})_6^{3-}]}{[\text{Fe}^{3+}][\text{CN}^{-}]^6} \Rightarrow [\text{Fe}^{3+}] = \frac{[\text{Fe}(\text{CN})_6^{3-}]}{(2.0 \times 10^{43})[\text{CN}^{-}]^6}$$

$$[\text{Fe}^{3+}] = \frac{0.0444}{(2.0 \times 10^{43})(0.511)^6} = \underline{\underline{1.2 \times 10^{-43} \text{ M}}}$$



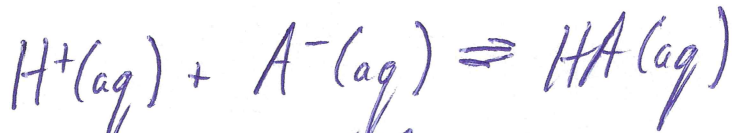
$$1.0 \times 10^{-24} = [\text{Mg}^{2+}]^3 [\text{PO}_4^{3-}]^2 \Rightarrow 1.0 \times 10^{-24} = (3x)^3 (2x)^2$$

$$1.0 \times 10^{-24} = 108 x^5 \Rightarrow x = \sqrt[5]{\frac{1.0 \times 10^{-24}}{108}} = 6.21 \times 10^{-6} \text{ mol/L}$$

↓ x MM (262.869/mol)

$$\underline{\underline{1.6 \times 10^{-3} \text{ g/L}}}$$

a) $n_{A^-} = C \times V = (0.222 \text{ mol/L}) (3.000 \text{ L}) = 0.666 \text{ mol}$
 $n_{H^+} = C \times V = (0.111 \text{ mol/L}) (1.000 \text{ L}) = 0.111 \text{ mol}$



i:	0.111	0.666	-
c:	-0.111	-0.111	+0.111
e:	-	0.555	0.111

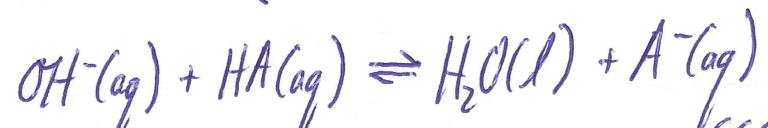
$$pH = pK_a + \log\left(\frac{[A^-]}{[HA]}\right) \Rightarrow pK_a = pH - \log\left(\frac{[A^-]}{[HA]}\right)$$

$$pK_a = 4.44 - \log\left(\frac{0.555}{0.111}\right) = 3.74$$

$$K_a = 10^{-3.74} = \underline{\underline{1.8 \times 10^{-4}}}$$

b) avant : $pH = pK_a + \log\left(\frac{[A^-]}{[HA]}\right) = -\log(5.5 \times 10^{-5}) + \log\left(\frac{0.222}{0.333}\right)$
 $= \underline{\underline{4.08}}$

$n_{HA} = C \times V = (0.333)(3.000) = 0.999 \text{ mol}$
 $n_{A^-} = C \times V = (0.222)(3.000) = 0.666 \text{ mol}$



i:	0.200	0.999	0.666
c:	-0.200	-0.200	+0.200
e:	-	0.799	0.866

après : $pH = pK_a + \log\left(\frac{[A^-]}{[HA]}\right) = -\log(5.5 \times 10^{-5}) + \log\left(\frac{0.866}{0.799}\right) = \underline{\underline{4.29}}$

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$$1) \quad \ominus \bar{N} = C = \bar{N} \ominus$$

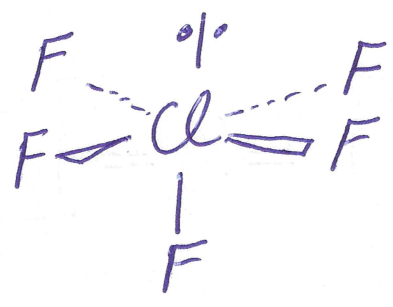
$$2) \quad \ominus \bar{O} - \overset{\oplus}{N} \equiv C.$$

$$3) \quad \ominus \bar{O} - \bar{O}.$$

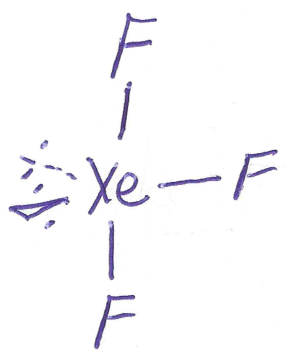
$$4) \quad \bar{O} = \bar{N} - \bar{O} \ominus$$

$$5) \quad -3$$

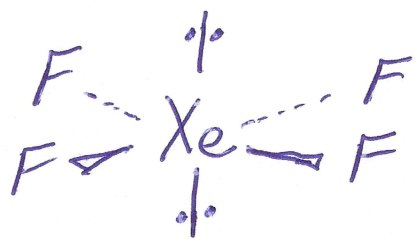
6)



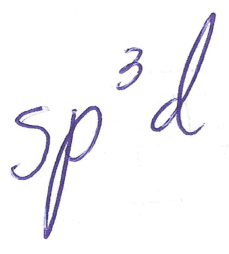
7)



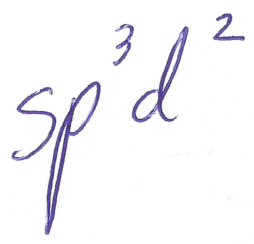
8)



9)



10)



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11)

3

12)

6

13)

16

14)

1

15)

6

16) α, K, Br, Rb

17) $+9$

18) Br^-

19) Ca^{2+}

20) de Broglie