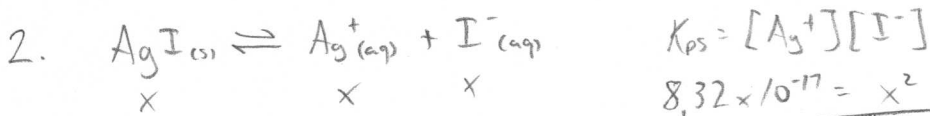


# Révision : solubilité Corrigé

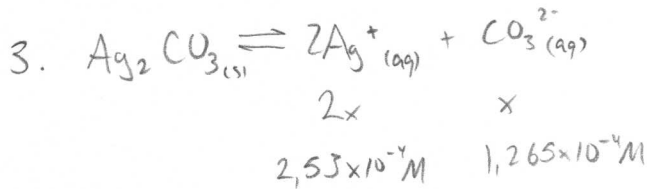
1. a.  $K_{ps} = [Pb^{2+}][I^-]^2$   
 b.  $K_{ps} = [Cu^{2+}]^3 [PO_4^{3-}]^2$



$$K_{ps} = [Ag^+][I^-]$$

$$8,32 \times 10^{-17} = x^2$$

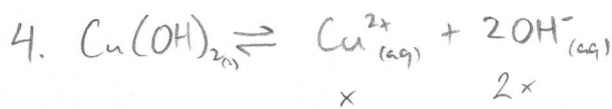
$$\boxed{9,12 \times 10^{-9} \text{ mol/L} = x = [Ag^+]}$$



$$K_{ps} = [Ag^+]^2 [CO_3^{2-}]$$

$$K_{ps} = (2,53 \times 10^{-4})^2 (1,265 \times 10^{-4})$$

$$\boxed{K_{ps} = 8,10 \times 10^{-12}}$$



$$K_{ps} = [Cu^{2+}][OH^-]^2$$

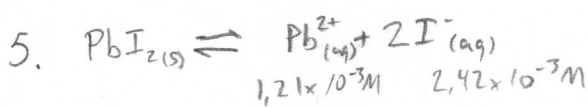
$$2,19 \times 10^{-20} = x(2x)^2$$

$$2,19 \times 10^{-20} = 4x^3$$

$$x = 1,76 \times 10^{-7} \text{ mol/L}$$

$$\boxed{[Cu^{2+}] = 1,76 \times 10^{-7} \text{ mol/L}}$$

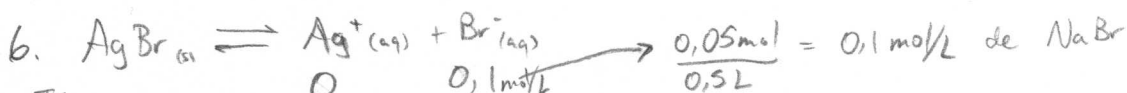
$$\boxed{[OH^-] = 3,52 \times 10^{-7} \text{ mol/L}}$$



$$K_{ps} = [Pb^{2+}][I^-]^2$$

$$K_{ps} = (1,21 \times 10^{-3})(2,42 \times 10^{-3})^2$$

$$\boxed{K_{ps} = 7,09 \times 10^{-9}}$$



I:

V:

E:

+x	+x
x	x + 0,1
∴ 0,1	

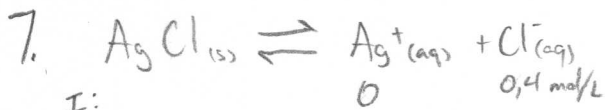
$$\frac{0,1}{K_{ps}} = \frac{0,1}{5,35 \times 10^{-13}} \rightarrow \text{SOO : On peut éliminer le x}$$

$$K_{ps} = [Ag^+][Br^-]$$

$$5,35 \times 10^{-13} = x(0,1)$$

$$\boxed{5,35 \times 10^{-12} = x = [Ag^+]}$$

Note: À l'équilibre, sans l'ajout du NaBr, la concentration de  $Ag^+$  serait de  $7,31 \times 10^{-7} \text{ mol/L}$  tel que prédit par le principe de Le Châtelier.



$$\begin{array}{l} \text{I:} \\ \text{V:} \\ \text{E:} \end{array} \quad \begin{array}{cc} 0 & 0,4 \text{ mol/L} \\ +x & +x \\ x & x+0,4 \end{array}$$

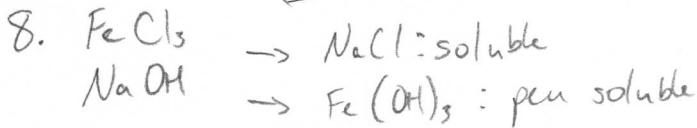
$$\frac{0,4}{K_{ps}} = \frac{0,4}{5,35 \times 10^{-13}} > 500$$

∴ On peut éliminer le x

$$K_{ps} = [\text{Ag}^+][\text{Cl}^-]$$

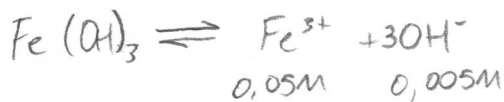
$$1,77 \times 10^{-10} = x(0,4)$$

$$\boxed{x = 4,43 \times 10^{-10} \text{ mol/L}} \quad (\text{au lieu de } 7,31 \times 10^{-7} \text{ mol/L si il n'y avait pas de Cl}^-)$$



$$[\text{Fe}^{3+}] : C_2 = \frac{0,1 \text{ M} \cdot 250 \text{ mL}}{(250 \text{ mL} + 250 \text{ mL})} = 0,05 \text{ M}$$

$$[\text{OH}^-] : C_2 = \frac{0,01 \text{ M} \cdot 250 \text{ mL}}{(250 \text{ mL} + 250 \text{ mL})} = 0,005 \text{ M}$$



$$Q_{ps} = [\text{Fe}^{3+}][\text{OH}^-]^3$$

$$= 0,05 \cdot 0,005^3 = 6,25 \times 10^{-9} > 2,79 \times 10^{-39}$$

↳  $K_{ps} \text{ Fe}(\text{OH})_3$

Il y aura un précipité.

$$9. K_{ps} \text{ du } \text{Li}_2\text{CO}_3 = 3,14 \times 10^{-2}$$

$$[\text{Li}^+] = 0,05 \text{ M}$$

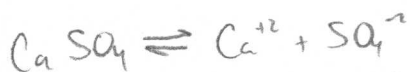
$$[\text{CO}_3^{2-}] = 0,05 \text{ M}$$

$$Q_{ps} = 2,5 \times 10^{-3} \text{ mol/L} < 3,14 \times 10^{-2}$$

Il n'y aura pas de précipité

$$10. [\text{Ca}^{2+}] : C_2 = \frac{0,02 \text{ M} \cdot 150 \text{ mL}}{(150 \text{ mL} + 200 \text{ mL})} = 8,571429 \times 10^{-3} \text{ M}$$

$$[\text{SO}_4^{2-}] : C_2 = \frac{0,0204 \text{ M} \cdot 200 \text{ mL}}{(150 \text{ mL} + 200 \text{ mL})} = 2,28571 \times 10^{-4} \text{ M}$$



$$Q_{ps} = [\text{Ca}^{2+}][\text{SO}_4^{2-}]$$

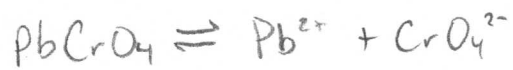
$$= (8,57 \times 10^{-3})(2,28 \times 10^{-4}) = 1,96 \times 10^{-6} < 4,93 \times 10^{-5}$$

↳  $K_{ps} \text{ de } \text{CaSO}_4$

Pas de précipité

$$11. [\text{Pb}^{2+}]: C_2 = \frac{(2,0 \times 10^{-6} \text{ M})(100 \text{ mL})}{(100 \text{ mL} + 250 \text{ mL})} = 5,714285714 \times 10^{-7} \text{ M}$$

$$[\text{CrO}_4^{2-}]: C_2 = \frac{(4,0 \times 10^{-10} \text{ M})(250 \text{ mL})}{(100 \text{ mL} + 250 \text{ mL})} = 2,857142857 \times 10^{-10} \text{ M}$$



$$Q_{ps} = [\text{Pb}^{2+}][\text{CrO}_4^{2-}]$$

$$= (5,71... \times 10^{-7})(2,857... \times 10^{-10})$$

$$= 1,63 \times 10^{-16} < 2,3 \times 10^{-13}$$

Pas de précipité