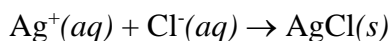


Solubility problems (calculator required)

1. A *Mohr Titration* is a procedure for finding out the amount of Cl^- in a solution by titrating it with aqueous AgNO_3 :



Calculate the Ag^+ concentration at the equivalence point, that being the point in the titration where the number of moles of added silver is equal to the moles of Cl^- ion initially present.
 $\text{pK}_{\text{sp}}(\text{AgCl}) = 9.7447$ [**$1.34 \times 10^{-5} \text{ M}$**]

2. Calculate the solubility (in g/100 mL) of $\text{Pb}_3(\text{AsO}_4)_2$ ($\text{pK}_{\text{sp}} 35.3979$) in:
 - a) Water [**2.94×10^{-6}**]
 - b) 0.10 M $\text{Pb}(\text{NO}_3)_2$ [**2.84×10^{-15}**]
3. The pH (at 37°C , where $K_w = 2.4 \times 10^{-14}$) of a certain metal hydroxide of formula $\text{M}(\text{OH})_3$ is 11.10. What is K_{sp} for the metal hydroxide at 37°C ? [**2.78×10^{-11}**]
4. A solution has $[\text{Cl}^-] = 2.0 \text{ M}$ and $[\text{Br}^-] = 0.010 \text{ M}$. AgNO_3 is slowly added to the solution. What will be the percent of the first ion remaining at the point of maximum separation of Br^- and Cl^- ? $\text{pK}_{\text{sp}}(\text{AgBr}) = 12.30103$ [**55.6% of Br^- remains**]