

Non Sibi High School

Andover's Chem 550/580: Advanced Chemistry

Chapter 18, Review Quiz 1

1

Calculate the molar solubility of lead(II) bromide ($K_{sp} = 4.0 \times 10^{-5}$). Include the solubility equilibrium reaction and K_{sp} expression in your answer.

2

The molar solubility of scandium(III) fluoride is 1.9×10^{-5} M. Calculate the value of K_{sp} for scandium(III) fluoride. Include the solubility equilibrium reaction and K_{sp} expression in your answer.

3

Predict if precipitation will occur when 14 mL of 6.5×10^{-5} M AgNO_3 is mixed with 56 mL of 3.5×10^{-4} M K_3PO_4 . ($K_{sp} = 8.9 \times 10^{-17}$ for Ag_3PO_4)

4

A metal hydroxide with the formula $\text{M}(\text{OH})_2$ was mixed with water and stirred until a saturated solution was created. The pH of the solution was found to be 9.88. Calculate the value of K_{sp} for the metal hydroxide.

5

Calculate the molar solubility of lead(II) bromide ($K_{sp} = 4.0 \times 10^{-5}$) in 0.25 M $\text{Pb}(\text{NO}_3)_2$. Include the solubility equilibrium reaction and K_{sp} expression in your answer.

6

An aqueous solution of $\text{Pb}(\text{NO}_3)_2$ is added dropwise to an aqueous mixture containing 0.010 M Br^- and 0.95 M I^- .

a. Calculate the minimum molarity of Pb^{2+} that must be reached to initiate precipitation of Br^- ($K_{\text{sp}} = 4.0 \times 10^{-5}$ for PbBr_2) and the minimum molarity of Pb^{2+} that must be reached to initiate precipitation of I^- ($K_{\text{sp}} = 8.5 \times 10^{-9}$ for PbI_2). Which precipitates first, Br^- or I^- ?

b. At the point when the second ion from the original mixture begins to precipitate, what percentage of the first ions initial molarity still remains unprecipitated in the solution? Can the Br^- and I^- mixture be effectively separated by fractional precipitation?



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