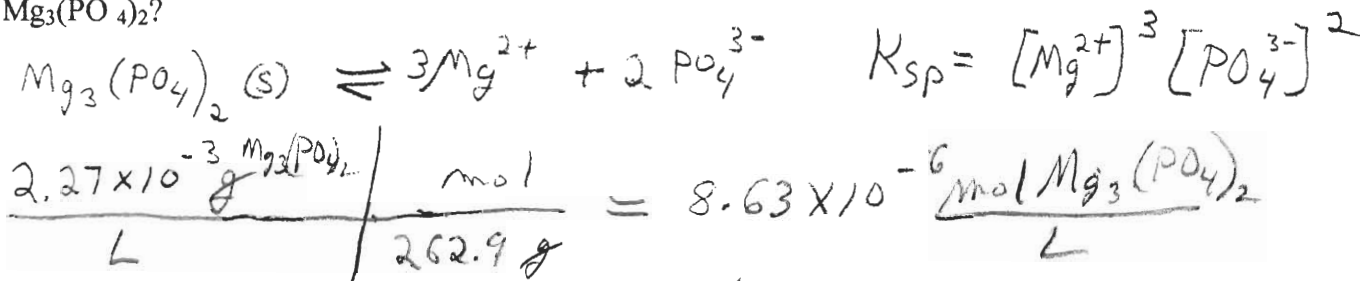


1. (8 Pts) The solubility of magnesium phosphate is 2.27×10^{-3} g/1.0 L of solution. What is the K_{sp} for $Mg_3(PO_4)_2$?



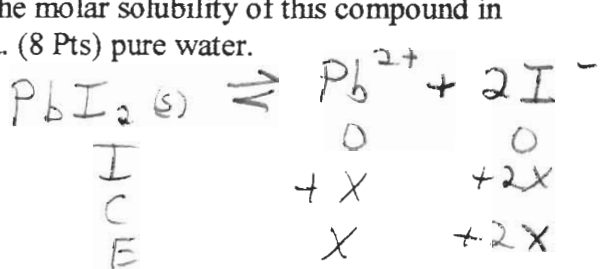
$$[Mg^{2+}] = 3 \times 8.63 \times 10^{-6} =$$

$$[PO_4^{3-}] = 2 \times 8.63 \times 10^{-6} =$$

$$K_{sp} = [3 \times 8.63 \times 10^{-6}]^3 [2 \times 8.63 \times 10^{-6}]^2 = \underline{\underline{5.17 \times 10^{-24}}}$$

2. Lead(II) iodide, PbI_2 , is an ionic compound with a solubility product constant K_{sp} of 7.9×10^{-9} . Calculate the molar solubility of this compound in

a. (8 Pts) pure water.



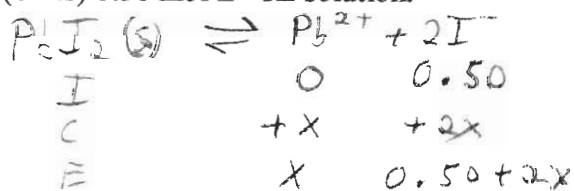
$$K_{sp} = [Pb^{2+}][I^{-}]^2$$

$$7.9 \times 10^{-9} = [x][2x]^2$$

$$x = 1.25 \times 10^{-3} = [Pb^{2+}]$$

$$\underline{\underline{1.25 \times 10^{-3} M}}$$

b. (8 Pts) 0.50 mol L^{-1} KI solution.



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

$$7.9 \times 10^{-9} = [x][0.50 + 2x]^2$$

$$7.9 \times 10^{-9} \approx [x][0.50]^2$$

$$\underline{\underline{x = 3.16 \times 10^{-8}}}$$