Answer on Question #83026, Chemistry / General Chemistry

The solubility product, Ks, of $Cd_3(PO_4)_2$ and 2.5×10^{-33}. What is the solubility (in g / L) of $Cd_3(PO_4)_2$ in pure water?

Solution

Find the molar solubility of $Cd_3(PO_4)_2$:

$Cd_3(PO_4)_2 \rightleftharpoons 3Cd^{2+} + 2PO_4^{3-}$

$2.5 \times 10^{-33} = (3s)^3 \times (2s)^2 = 108s^5$

$s = 1.18 \times 10^{-7}$ (mol/L)

Convert mol/L into g/L:

$S_{new} = s \times M(Cd_3(PO_4)_2) = 1.18 \times 10^{-7} \times 527.2 =$ **6.24×10^{-5} (g/L)**

Answer

6.24×10^{-5} g/L is the solubility of $Cd_3(PO_4)_2$ in pure water.