Question #57946, Chemistry, Other

What mass of Mg(OH)$_2$ will dissolve in 1.0 L of 0.050 mol/L solution of MgSO$_4$?

K$_{sp}$ = 5.6 x 10^{-12}

Answer:

K$_{sp}$=[Mg^{2+}]·[OH$^-$]^2

If we will plug these values in the K$_{sp}$ expression: 5.6 x 10^{-12} = (x+0.05) * (2x)^2
If we suppose that x << 0.050, we have 0.20 x^2= 5.6 x 10^{-12};
x = 5.29 x 10^{-6} moles/liter
Molar mass of Mg(OH)$_2$ is 58.32 g/ mol
So we have 58.32 g/mol * 5.29 x 10^{-6} mol/liter = 3.09 x 10^{-4} g/liter
3.09 x 10^{-4} g of Mg(OH)$_2$ dissolve per liter of 0.05 M Mg^{2+} solution at 25°C.