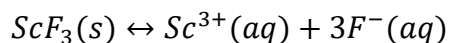


### Answer on the Question #64415, Chemistry / General Chemistry

$K_{sp}$  for scandium fluoride ( $ScF_3$ ) at 298 K is  $4.2 \times 10^{-18}$ . Write the chemical equation for the solubility equilibrium of scandium fluoride in water. What concentration of  $Sc^{3+}$  ions is required to cause a precipitate to form if the fluoride ion concentration is 0.076M?

#### Solution:

Equilibrium of scandium fluoride in water:



Concentration of scandium ions needed for precipitation of fluoride ions:

$$K_{sp}(ScF_3) = [Sc^{3+}] \cdot [F^{-}]^3$$
$$[Sc^{3+}] = \frac{K_{sp}(ScF_3)}{[F^{-}]^3} = \frac{4.2 \cdot 10^{-18}}{0.076^3} = 9.5 \cdot 10^{-15} M$$

**Answer:**  $[Sc^{3+}] = 9.5 \cdot 10^{-15} M$