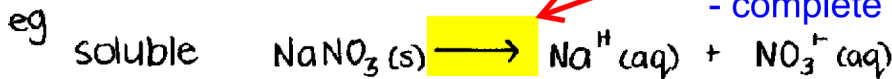


Ksp - Ionic Aqueous Equilibria

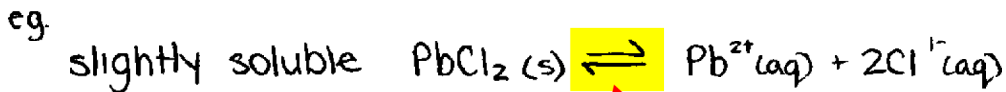
June 4.13

- equilibria involving "slightly soluble salt" (previously called insoluble)
- all in aqueous solution (i.e. water)

- note arrow style
- represents a non-equilibrium
- complete dissociation



↳ see rule #1,4 from solubility rules sheet.

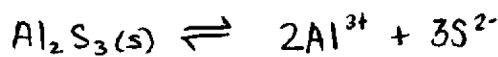


$K_{sp} = [\text{Pb}^{2+}][\text{Cl}^-]^2$

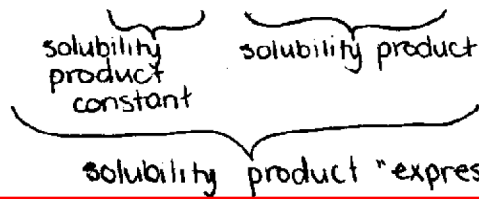
- special type of K_{eq}
- stands for "solubility product"

- insoluble - see rule #6 from solubility rule sheet
- available K_{sp} value of 1.6×10^{-5} from "solubility product constant" sheet

eg.



$K_{sp} = [\text{Al}^{3+}]^2[\text{S}^{2-}]^3$



- note arrow style
- represents an equilibrium situation
- partial dissociation

small but critically important point

Solubility: is defined as the mol/L of a salt that will dissolve in water to form a saturated solution

solubility: use mol/L for the compound ion concentration from the compound are in M

- Unsaturated (more salt can dissolve) $K_{sp} > [\text{Cation}][\text{Anion}]$
- saturated (AT EQUILIBRIUM ☺) $K_{sp} = [\text{Cation}][\text{Anion}]$
- Supersaturated (more salt than normally possible) $K_{sp} < [\text{Cation}][\text{Anion}]$

→ supersaturated solutions will form precipitates (solid form of salt) until reduced to saturated concentration.