

Solubility, K_{sp} and pH

50 mL of a saturated solution of calcium hydroxide contains 0.022 g of calcium ions in solution. Determine:

- a) The pH of this solution
- b) The solubility product constant

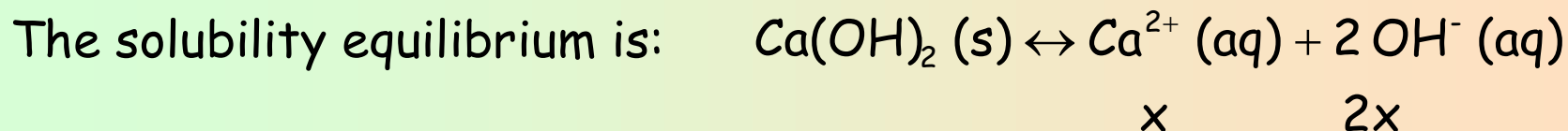
Atomic weight: $Ca=40$

Solubility, K_{sp} and pH

50 mL of a saturated solution of calcium hydroxide contains 0.022 g of calcium ions in solution. Determine:

- a) The pH of this solution
- b) The solubility product constant

Atomic weight: Ca=40



"x" is the molar concentration of calcium ions:

$$x = [\text{Ca}^{2+} (\text{aq})] = \frac{0.022 \text{ g Ca}^{2+}}{0.05 \text{ L}} * \frac{1 \text{ mol Ca}^{2+}}{40 \text{ g Ca}^{2+}} = 0.011 \text{ M}$$

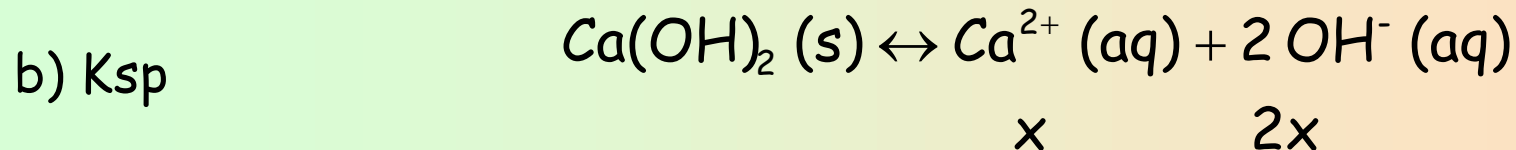
Solubility, Ksp and pH

50 mL of a saturated solution of calcium hydroxide contains 0.022 g of calcium ions in solution. Determine:

- The pH of this solution
- The solubility product constant

Atomic weight: Ca=40

a) pH $[\text{OH}^-] = 2x = 0.022 \text{ M} \rightarrow \text{pOH} = 1.66$
 $\text{pH} = 14 - \text{pOH} = 12.34$



$$K_{\text{sp}} = [\text{Ca}^{2+}][\text{OH}^-]^2 = (x) * (2x)^2 = 4 x^3$$

$$K_{\text{sp}} = 4 (0.011)^3 = 5.3 * 10^{-6}$$