

## Ionic Compound Solubility Examples

### *Molar Solubility*

- 1) Calculate the molar solubility of calcium carbonate. ( $pK_{sp} = 8.4$ )

### *Common Ion Effect*

- 2) Calculate the molar solubility of calcium carbonate in a 0.010 M solution of carbonate ion.

### *Will it Precipitate?*

- 3) At what  $[OH^-]$  (and pH) will copper (II) hydroxide begin to precipitate from a 0.010 M solution of copper (II) ion?
- 4) What is the maximum concentration of  $Pb^{+2}$  that can exist in a 0.15 M chloride ion solution before  $PbCl_2$  precipitates?
- 5) After mixing two solutions, the mixture has  $[Ca^{+2}] = 1.7 \times 10^{-5}$  M and  $[PO_4^{-3}] = 2.5 \times 10^{-6}$  M. Will a calcium phosphate precipitate form?

### Answers

- 1)  $6.3 \times 10^{-5}$  M
- 2)  $4.0 \times 10^{-7}$  M
- 3)  $5.0 \times 10^{-9}$  M (pH 5.7)
- 4)  $7.1 \times 10^{-4}$  M
- 5)  $Q = 3.1 \times 10^{-26}$  (Q >  $K_{sp}$  so it will precipitate)