

Solutions : Quiz 3-150

1)a) If 0.72 moles of NaCl are added to 2.5 L of water, find the concentration of the NaCl solution.

b) If 50. mL of a 0.30 M solution of CaCl₂ is added to 40. mL of 0.60 M KCl solution, find the following:

i) [Ca²⁺] = _____ ii) [K⁺] = _____ iii) [Cl⁻] = _____

c) A BaCl₂(aq) solution is added to a NaOH(aq) solution. Write down the net ionic equation.

2) A saturated solution is made with magnesium carbonate.

a) The K_{sp} (at 25°C) is _____ .

b) The solubility is _____ mol/L.

c) The solubility is _____ g/L.

3)a) Write down the solubility product expression for Ag₂CO₃(s).

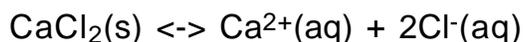
b) Find the solubility for a saturated solution of this salt.

4) A saturated solution of calcium hydroxide has a solubility of 0.0027 M. Find the K_{sp}.

5) Strontium hydroxide is soluble. What solution would you add to precipitate the strontium ions?

6) If 5.0 mL of 0.10 M HCl solution is added to 10. mL of 0.20 M Pb(NO₃)₂ solution, will a precipitate form?

7) In a saturated solution of the salt CaCl₂, we have the equilibrium:



a) Explain what happens when silver nitrate solution is added.

b) How would you decrease the solubility of the salt?

8) Find the maximum concentration of fluoride ions in a $\text{CaF}_2(\text{aq})$ solution at 25°C . ($K_{\text{sp}} = 3.9 \times 10^{-11}$)

Answers: 1)a) 0.29 M, b)i) 0.17 M, ii) 0.27 M, iii) 0.60 M, c) $\text{Ba}^{2+}(\text{aq}) + 2\text{OH}^{-}(\text{aq}) \rightarrow \text{Ba}(\text{OH})_2(\text{s})$, 2)a) 6.8×10^{-6} , b) 2.6×10^{-3} , c) 0.22, 3)a) $[\text{Ag}^+]^2[\text{CO}_3^{2-}]$, b) $1.3 \times 10^{-4}\text{M}$, 4) 7.9×10^{-8} , 5) $\text{Na}_2\text{SO}_4(\text{aq})$, and others..., 6) Yes, $K_{\text{trial}} = [\text{Pb}^{2+}][\text{Cl}^-]^2 = 1.5 \times 10^{-4} > 1.2 \times 10^{-5}$ ($= K_{\text{sp}}$ for PbCl_2), 7)a) Equilibrium shifts right as AgCl precipitates., b) Add Ca^{2+} or Cl^- ions. e.g. add $\text{NaCl}(\text{aq})$., 8) 4.3×10^{-4} M.