

Chemistry CP

Name: _____

Solubility Product Constant Problems

Section: _____

Level 2

1. What is meant by the symbol K_{sp} ?
2. Write a balanced chemical equation for the solubility equilibrium set up when these insoluble ionic compounds are mixed with water.
a) $\text{CaCO}_3(\text{s})$ b) $\text{AgBr}(\text{s})$ c) $\text{PbSO}_4(\text{s})$
3. Write the solubility product constant (K_{sp}) expression for each of the solids in question 2.
4. Write the solubility constant product (K_{sp}) expression for each of the following solids as they are mixed with water.
A) PbCl_2 b) $\text{Mg}(\text{OH})_2$ c) $\text{Fe}(\text{OH})_3$
5. When you prepare a saturated solution of calcium sulfate, CaSO_4 , you find that the concentration of both the Ca^{2+} ions and the SO_4^{2-} ions is 0.0049 M. What is the value of K_{sp} for calcium sulfate?
(2.4×10^{-5})
6. Sea water is saturated with AgCl . The chloride ion concentration in sea water is 0.53 M, and the solubility product constant for AgCl is 1.7×10^{-10} . Calculate the concentration of silver ion found in sea water.
(3.2×10^{-10} M)
7. The solubility product constant for silver iodide, AgI , in water at 25°C is 8.3×10^{-17} . Calculate the solubility of AgI . Report your answer in units of grams of silver iodide per liter of solution.
(2.1×10^{-6} g/L)

Challenge Problem

8. The solubility product constant for lead (II) chloride is 1.7×10^{-5} . How many moles of lead nitrate can dissolve in 1.00 L of a 0.1 M solution of sodium chloride? (Hint: One of the ions found in PbCl_2 , the chloride ion, is already present in the solution. That can be taken to be its equilibrium concentration.)
(0.0017 mol can be dissolved)