

Solubility Products Worksheet #2

- Predict whether the following compounds are soluble or insoluble.
 - PbSO_4
 - Na_2CO_3
 - FeS
 - AgNO_3
 - $\text{Cu}(\text{OH})_2$
- Predict whether or not a precipitate will form when aqueous solutions of the following pairs of substances are mixed. If a reaction occurs, write the balanced equation for the reaction and also the corresponding net ionic equation.
 - $\text{Na}_2\text{CO}_3(\text{aq}) + \text{CaCl}_2(\text{aq}) \rightarrow$
 - $\text{NaNO}_3(\text{aq}) + \text{CaBr}_2(\text{aq}) \rightarrow$
 - $\text{AgNO}_3(\text{aq}) + \text{NaI}(\text{aq}) \rightarrow$
 - $\text{BaCl}_2(\text{aq}) + \text{MgSO}_4(\text{aq}) \rightarrow$
 - $\text{HCl}(\text{aq}) + \text{Pb}(\text{NO}_3)_2(\text{aq}) \rightarrow$
- What are the solubility product constant (k_{sp}) expressions for each of the following?
 - $\text{Fe}(\text{OH})_3$
 - $\text{Ca}_3(\text{PO}_4)_2$
 - AgCl
 - BaF_2
 - Bi_2S_3
- Given the solubility for each of the following compounds, calculate the solubility product constant.

	Compound	Solubility
(a)	MgF_2	0.0012 mol/L
(b)	PbS	1.84×10^{-14} mol/L
(c)	CaF_2	2.15×10^{-4} mol/L
- Given the solubility constants for the following compounds, calculate the molar solubility.
 - AgCl $k_{\text{sp}} = 1.7 \times 10^{-16}$
 - $\text{Pb}(\text{OH})_2$ $k_{\text{sp}} = 4.2 \times 10^{-15}$
- Calculate the molar solubility of calcium fluoride, CaF_2 ($k_{\text{sp}} = 3.4 \times 10^{-11}$), in each of the following:
 - pure water
 - 0.01 mol/L $\text{CaCl}_2(\text{aq})$
 - 0.10 mol/L $\text{NaF}(\text{aq})$
- What is the solubility of $\text{Ca}_3(\text{PO}_4)_2$ ($k_{\text{sp}} = 1.3 \times 10^{-32}$) in each of the following:
 - 0.10 mol/L $\text{CaCl}_2(\text{aq})$
 - 0.10 mol/L $\text{Na}_3\text{PO}_4(\text{aq})$