

Solubility Equilibria Worksheet.

- 1 a. $(\text{NH}_4)_2\text{S}$. soluble f. BaSO_4 insoluble. P 114
 b. ZnCO_3 slightly soluble (I) g. Hg_2Cl_2 insoluble
 c. $\text{Mg}(\text{OH})_2$ slightly soluble (I) h. CaBr_2 soluble.
 d. Na_2CO_3 soluble. i. CoS slightly soluble (I).
 e. FeS . slightly soluble (I)

- 2 a. $\text{CaCl}_2(\text{aq}) + 2\text{AgNO}_3(\text{aq}) \rightarrow \text{Ca}(\text{NO}_3)_2(\text{aq}) + 2\text{AgCl}(s)$
 $\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(s)$.
 b. $2\text{KOH}(\text{aq}) + \text{MgCl}_2(\text{aq}) \rightarrow 2\text{KCl}(\text{aq}) + \text{Mg}(\text{OH})_2(s)$
 $\text{Mg}^{2+}(\text{aq}) + 2\text{OH}^-(\text{aq}) \rightarrow \text{Mg}(\text{OH})_2(s)$.
 c. $\text{KOH}(\text{aq}) + \text{NaCl}(\text{aq}) \rightarrow \text{KCl}(\text{aq}) + \text{NaOH}(\text{aq})$
 d. $2\text{KCl}(\text{aq}) + \text{Pb}(\text{NO}_3)_2(\text{aq}) \rightarrow \text{PbCl}_2(s) + 2\text{KNO}_3(\text{aq})$
 $\text{Pb}^{2+}(\text{aq}) + 2\text{Cl}^-(\text{aq}) \rightarrow \text{PbCl}_2(s)$.
 e. $(\text{NH}_4)_2\text{S}(\text{aq}) + \text{Ni}(\text{NO}_3)_2(\text{aq}) \rightarrow 2\text{NH}_4\text{NO}_3(\text{aq}) + \text{NiS}(s)$.
 $\text{Ni}^{2+}(\text{aq}) + \text{S}^{2-}(\text{aq}) \rightarrow \text{NiS}(s)$.

- 3 a. $\text{AgBr} 5.0 \times 10^{-13}$ AgSCN 1×10^{-12} P A24
 b. $\text{SrCO}_3 7.0 \times 10^{-10}$ SrSO_4 1.2×10^{-5}
 c. MgF_2 6.4×10^{-9} CaF_2 4.0×10^{-11}
 d. ZnS 1.5×10^{-22} Bi_2S_3 1.1×10^{-73}
 $= x^2$ $= (2x)^2 \cdot (3x)^3 = 4x^2 \cdot 27x^3 = 108x^5$
 $x = 1.5 \times 10^{-11}$ $x = 1.0 \times 10^{-15}$
 e. Ag_2S 1.6×10^{-49} SnS_2 1×10^{-26}
 f. $\text{Ca}_3(\text{PO}_4)_2$ 1.3×10^{-32} . $\text{Ag}_3(\text{PO}_4)$ 1.8×10^{-18} .
 $= (3x)^3 (2x)^2$ $= (3x)^3 x$
 $= 27x^3 \cdot 4x^2$ $= 27 \times 3 \cdot x$
 $= 108x^5$ $= 27 \times 4$
 $x = 4.1 \times 10^{-8}$. $x = 1.6 \times 10^{-5}$