OER 15.1

CHE 112 - Homework - Ch 15a
Solubility and Precipitation

Score: _____/30

Name: _____ Date: _____

[6 pt] 1. Write the K_{sp} equilibrium equation for the dissolution of the following compounds in water:

(a) $MgSO_4$

(b) $Ba(NO_3)_2$

(c) $Al_2(CO_3)_3$

[6 pt] 2. A saturated solution of $Ca_3(PO_4)_2$ has $[Ca^{+2}] = [PO_4{}^{-3}] = 2.9 \times 10^{-7}$M.

(a) What is the value of K_{sp}? 2(a) _____

(b) What is the $[Ca^{+2}]$in a saturated solution of $Ca_3(PO_4)_2$ that has $[PO_4{}^{-3}] = 0.010$ M? 2(b) _____

(c) What is the $[PO_4{}^{-3}]$ in a saturated solution of $Ca_3(PO_4)_2$ that has $[Ca^{+2}] = 0.010$ M? 2(c) _____

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[6 pt] 3. Calculate the solubility of MgF_2 ($K_{sp} = 7.4 \times 10^{-11}$ in water at 25 °C in units of:

(a) Molar Solubility (mol/L): 3(a) _____

(b) grams per Liter: 3(b) _____

[4 pt] 4. Will a precipitate of $PbCl_2$ ($K_{sp} = 1.2 \times 10^{-5}$) form if the concentration of $Pb_2{}^+$ ions is 6.0×10^{-2} mols and $Cl^- = 8.0 \times 10^{-2}$ mols? Explain. 4. _____

[4 pt] 5. Will a precipitate of $PbCl_2$ form on mixing equal volumes of 0.010 M $Pb(NO_3)_2$ and 0.010 M HCl? Explain. 5. _____

[4 pt] 6. For the solution made in the previous problem, what is the minimum concentration of $[Cl^-]$ required to begin precipitation from a 5.0×10^{-3} M solution of $Pb(NO_3)_2$. Explain. 6. _____