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Last \_\_\_\_\_

First \_\_\_\_\_

**Question 1**

3 Points

Rank the following salts from 1-3 in order of increasing solubility with 1 being the most soluble and 3 being the least soluble.

- $\text{CaF}_2$   $K_{\text{sp}} = 3.9 \times 10^{-11}$  \_\_\_\_\_
- $\text{NiCO}_3$   $K_{\text{sp}} = 6.6 \times 10^{-9}$  \_\_\_\_\_
- $\text{Fe}_2\text{S}_3$   $K_{\text{sp}} = 1.4 \times 10^{-88}$  \_\_\_\_\_

**Question 2**

6 Points

The maximum amount of zinc(II) phosphate that will dissolve in a 0.140 M potassium phosphate solution is:

Zinc(II) phosphate:  $K_{\text{sp}} = 9.1 \times 10^{-33}$

	+		+	
I				
C				
E				

\_\_\_\_\_ M

**Question 3**

7 Points

Write a balanced net ionic equation to show why the solubility of  $\text{Al}(\text{OH})_3(\text{s})$  increases in the presence of a strong acid and calculate the equilibrium constant for the reaction of this sparingly soluble salt with acid.

Must show work when calculating K -  $K_{\text{sp}} \text{Al}(\text{OH})_3 = 1.9 \times 10^{-33}$  ;  $K_{\text{w}} = 1 \times 10^{-14}$

\_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ + \_\_\_\_\_

K = \_\_\_\_\_

**Question 4**

4 Points

Rank the following substances from 1-4 in order of increasing entropy with 1 being the lowest entropy and 4 being the highest entropy.

- $\text{SnCl}_4(\text{l})$  \_\_\_\_\_
- $\text{SnCl}_4(\text{g})$  \_\_\_\_\_
- $\text{Sn}(\text{s})$  \_\_\_\_\_
- $\text{SnO}_2(\text{s})$  \_\_\_\_\_