



9. Magnesium hydroxide,  $\text{Mg}(\text{OH})_2$ , (Milk of Magnesia) has a solubility of  $7.05 \times 10^{-3} \text{ g/L}$ . Calculate the  $K_{sp}$  value for  $\text{Mg}(\text{OH})_2$ . (/3)
10. The molar solubility of barium phosphate is  $1.4 \times 10^{-8} \text{ mol/L}$ . Calculate the  $K_{sp}$  value for  $\text{Ba}_3(\text{PO}_4)_2$ . (/2)
11. A student prepared a saturated sol'n of calcium chromate and found that when **100 mL** of this sol'n was evaporated, **0.416 g** of  $\text{CaCrO}_4$  was left in the dish. Calculate the  $K_{sp}$  value for this salt. (/2)
12. Calculate a) the **molar** solubility of calcium carbonate & b) the solubility of  $\text{CaCO}_3$  in **g/100 mL**. (/2)
13. What is the molar concentration of  $\text{OH}^-$  ions in a saturated sol'n of zinc hydroxide? (/2)
14. If  $2.0 \times 10^{-5} \text{ mol}$  of sparingly soluble  $\text{Cu}(\text{IO}_3)_2$  can dissolve in 2 L of a very soluble  $\text{NaIO}_3$  sol'n, what is the molar concentration of the  $\text{NaIO}_3$  sol'n? ( $K_{sp} = 1.4 \times 10^{-5}$  for  $\text{Cu}(\text{IO}_3)_2$ ) (/2)
15. Determine whether a precipitate forms when the following sol'ns are mixed: (/6)
- a) Equal volumes of  $4 \times 10^{-4} \text{ M}$   $\text{Ba}(\text{NO}_3)_2$  and  $8 \times 10^{-6} \text{ M}$   $\text{Na}_2\text{SO}_4$
- b) 2.0 g of  $\text{Mg}(\text{ClO}_3)_2$  are added to 100 mL of 0.05 M  $\text{KNO}_3$
16. When 100 mL of  $2.5 \times 10^{-5} \text{ M}$  ferrous chloride is added to 150 mL of  $6.7 \times 10^{-5} \text{ M}$  sodium hydroxide a precipitate just starts to form. What is the  $K_{sp}$  for  $\text{Fe}(\text{OH})_2$ ? (/3)

**Application Questions (justify all answers by making reference to concepts discussed in class)**

18. Pick 3 of the following 5 questions and answer for the application section. (3 marks each = /9)
- Pg 458 #8ab (counts as 2 questions)
- Pg 449 #9
- Pg 438 # 11a
- Pg 460 #12
- Pg 489 #6

**\*\* if you are ambitious, you may do them all for bonus marks. (bonus questions still worth 3 each!)**

**Lab (/15)**

19. Chemical Equilibrium: Finding a Constant,  $K_e$ : Write the following:

- **Purpose:** 2-3 sentences stating why we performed this lab
- **Data and Calculations:** hand in data sheet
- **Conclusion:** state your  $K_e$  constant and any errors you encountered in the lab