Chem 201 Self Quiz #1

Select the letter of the best answer for each of the following questions.

1. What is the molarity of the solution which contains 5.0 g of NaOH (formula weight = 40 g/mole) dissolved in water to make 200 mL of solution?

    a. 0.025 $\underline{M}$
    b. 0.13 $\underline{M}$
    c. 0.20 $\underline{M}$
    d. 0.63 $\underline{M}$
    e. 1.6 $\underline{M}$

2. What is the weight percent of NaCl in a solution made by dissolving 20 g of NaCl (FW = 58 g/mole) in 200 mL of water?

    a. 0.16%
    b. 0.17%
    c. 9.1%
    d. 10%
    e. 17%

3. When 40.0 mL of 2.0 $\underline{M}$ NaCl (FW = 58) is diluted to 100.0 mL, what is the new concentration?

    a. 0.20 $\underline{M}$
    b. 0.50 $\underline{M}$
    c. 0.80 $\underline{M}$
    d. 5.0 $\underline{M}$
    e. need more information to answer this question

4. How many moles of NaOH (FW = 40 g/mole) are there in 50 mL of 0.30 $\underline{M}$ NaOH solution?

    a. 0.006
    b. 0.015
    c. 0.60
    d. 6
    e. 15

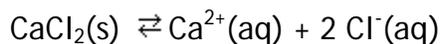5. What is the species concentration of Na^+ in a 0.50 $\underline{M}$ solution of Na_2SO_4?

    a. 0.20 $\underline{M}$
    b. 0.25 $\underline{M}$
    c. 0.50 $\underline{M}$
    d. 1.0 $\underline{M}$
    e. 2.0 $\underline{M}$

6. How many moles of chloride ion are there in 100 mL of 0.50 $\underline{M}$ $AlCl_3$?

    a. 0.050
    b. 0.10
    c. 0.15
    d. 0.5
    e. 1.5

Answer the following questions.

7. What is the appropriate equilibrium constant expression for this reaction?

$$CaCl_2(s) \rightleftharpoons Ca^{2+}(aq) + 2\ Cl^-(aq)$$

8. If the solubility of $CaCl_2$ is 74.5 g in 100 mL, what are the species concentrations of Ca^{2+} and Cl^- and what is the value of K_{sp} for $CaCl_2$?

9. Solid SrO_4 is shaken with a 0.0010 M K_2SO_4 solution until equilibrium, whereupon it is found that the solution contains 0.042 g $SrSO_4$/L. Calculate the solubility product of $SrSO_4$.