**CH1020 Exercises (Worksheet 6)**

1. Calculate the molarity of each of the following solutions:
    a. 0.250 mol NaCl in 175 mL of solution
    b. 0.070 mmol $AgNO_3$ in 50 µL of solution
    c. 1.2 mmol Na_2SO_4 in 0.10 L solution
    d. 7.8 g NaOH in 150 mL solution

2. Phosphate-buffered saline (abbreviated PBS) is a buffer solution commonly used in biological and biochemical research. A typical composition of a PBS is as follows:
    137 mM NaCl
    2.70 mM KCl
    10.0 mM Na_2HPO_4
    1.80 mM KH_2PO_4
    You want to prepare 500 mL of PBS buffer. How many grams do you need of each component of the buffer?

3. The solubility of AgCl in water is 0.002 g/L. Is it possible to make a 0.010 mM AgCl aqueous solution?

4. How many moles of Na are in each of the following solutions:

    a. 0.70 L of 0.50 M NaCl
    b. 400 mL of 0.10 M Na_3PO_4

5. What is the molarity of Cl^- in each of these solutions:
    a. 0.200 M $AlCl_3$
    b. 0.450 M $FeCl_2$

6. What volume of 0.200 M ethanol solution contains 0.450 mol ethanol?

7. What volume of 1.5 M $SrCl_2$ is needed to prepare 400.0 mL of a 10 mM solution?

8. Classify each compound as a strong electrolyte, weak electrolyte or non-electrolyte

    a. CsCl
    b. CH_3CH_2OH (ethanol)
    c. NH_3 (weak base)
    d. $FeCl_3$
    e. Na_2SO_4
    f. $PbCl_2$ (very low solubility)

9. You are mixing 30.0 mL of 0.700 M K_3PO_4 with 0.0500 L of 0.400 M KCl solution. What is the final concentration of the common ion?

10. You are mixing 200 cm^3 of 0.6M $FeCl_2$ and 300 cm^3 of 200 mM $FeCl_3$. Identify the common ion and determine its concentration in the resulting solution.