WODSS SCIENCE
SCH 3UI

Name: _____
Date: _____

Concentration Problems

1. Whole milk usually contains 5.0% milk fat by volume/volume. If you drink a 250.0 mL glass of whole milk, how much milk fat have you consumed? (13mL)

2. A solution contains 5.30 g of potassium chloride in 255.5 g of water. Calculate the weight/weight percent of solute in this solution. Don't ignore the mass of the solute! (2.03% W/W)

3. Vinegar is sold as a 5.0% (V/V) solution of acetic acid in water. Assuming that liquid volumes are additive, what volume of water must be added to 15 mL of acetic acid to produce synthetic vinegar? (285 mL)

4. Electrician's solder is 60.0% tin and 40.0% lead by mass. What is the mole ratio of the two elements? (2.62 Sn: 1 Pb)

5. Evaporation of a 23.47 g sample of slush yields a 4.58 g CaCl2 salt residue. Calculate the weight/weight percentage of calcium chloride in the slush. (19.5% W/W)

6. The recommended W/V percentage for a TSP solution used to clean walls before wallpapering is 1.7%. What mass of TSP is needed to make 2.0 L of this solution? (34 g)

7. Ammonium nitrate, which is a major ingredient in fertilizers releases nitrate ion into the water. The World Health Organization has set an upper limit of 10.0ppm for infants. If an infant has a mass of 4.0 kg, what is the maximum mass of nitrate ions that would be permitted in the infant's body tissues? (40. mg)

Dilution Problems

1. What volume of a 6.0 mol/L sulfuric acid solution would be required to make 500 mL of 0.24 mol/L sulfuric acid? (20 mL)

2. a) What volume of 6.0 mol/L hydrochloric acid would be diluted with water to prepare 1.0 L of 1.2 mol/L hydrochloric acid?(0.20 L)

b) How much water should be added?(0.8 L)

3. What volume of 17.2 mol/L acetic acid should be taken and diluted with water to make 1.00 L of 0.100 mol/L acetic acid? (0.00581 L)

4. What volume of concentrated 14 mol/L ammonia (NH_3) should be measured out and diluted with enough water to make 5.0 L of a 0.10 mol/L solution? (0.036 L)

5. What would be the concentration (in mol/L) of a solution made by adding 200 mL of water to 50 mL of a 5.0 mol/L solution of potassium chloride?(1.0 mol/L)

6. What volumes of 12.0 mol/L potassium nitrate solution and water would have to be mixed in order to produce 300 mL of a 8.00 mol/L solution? (200 mL KNO_3 solution + 100 mL water)

7. If 150 mL of water are added to 250 mL of a 0.24 mol/L solution of hydrochloric acid what will be the concentration in mol/L?(0.15 mol/L)

8. The cafeteria decides to save money by using concentrated acetic acid (CH_3COOH at 17.5 mol/L) and diluting it with water to produce vinegar (5.00% m/v acetic acid).

a) What is the concentration of vinegar in mol/L? (0.833 mol/L)

b) What volume of vinegar can the cafeteria produce from a 4.00 L jug of concentrated acetic acid? (84.0 L)

c) How much water would they need to add to the concentrated acetic acid. (80.0 L water)