Homework 5

September 30, 2022

Weekly homework assignments are posted approximately one week prior to the due date. Collaborations are encouraged and students must report all collaborators in writing on each assignment. All external sources (websites, books) must be properly cited. Additional problems are listed at the end of each assignment. This week's assignment is due *Friday, Oct 7th at 11:59pm.*

Making Solutions

1) As a scientist, you are preparing 1.5M stock solution of KCl(aq) that is often used to treat patients with low potassium levels. How many grams of KCl(s) is needed to make 5L of 1.5M KCl(aq)? Report to 2 significant figures. (1 pt)

2) In your own words, how would you make 0.75M HCl(aq) solution from 5.0M HCl? Describe the steps and lab equipment that would be used. (2 pts)

Mass Percent from Solutions

3) Find the percent by mass of dextrose (also known as glucose) in a 1.5 M dextrose solution. The density of the solution is 1.56 g/mL. Report to 3 significant figures. (2 pts)

Acid-Base Reaction

4) Suppose you have 1L of 1.5M HCl(aq) and you want to neutralize the acid with 1M KOH(aq). Report to 2 significant figures. (2 pts)

a) Write the balanced chemical equation of this acid-base reaction.

b) Determine how many mols of 1M KOH(aq) is needed to react with 1L of 1.5M HCl(aq).

Precipitation Reaction

5) In a lab, you perform an experiment mixing 0.150M KCl(aq) with 0.175L of 0.200M $Pb(NO_3)_2$ solution. Report to 3 significant figures. (3 pts)

a) Write a complete and balanced chemical reaction described.

b) What volume in L of 0.150M KCl(aq) is required to react with 0.175L of 0.200M $Pb(NO_3)_2$.

Optional Textbook Problems: Ch. 4- $4.3 - 4.7$ odd, $4.21 - 4.47$ odd, $4.61 - 4.89$ odd; Ch. 5 - $5.37 - 5.41$ odd; $5.47 - 5.53$ odd