Homework 4

September 26, 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, Sept 30thth at 11:59pm.*

Molar Mass and Mass Percent Composition

1) A metal M forms an oxide with the formula M_2O_3, for which the mass percentage of the metal is 69.9%. (3 pts)

a) What is the identity of the metal?

b) Write the name of the compound.

Empirical and Molecular Formula

2) A chemist performed a chemical reaction that combines 7.035g sulfur with fluorine to produce 23.42g of gas. Report to 4 sig figs. (3 pts)

a) What is the empirical formula of the gas?

b) Assuming that the empirical and molecular formulas of the compound are the same, what is its name?

Molarity and Dilution

3) Medical hospitals often prepare solutions with specific ionic concentrations. A lab technician makes a 150.0mL solution containing 0.750g NaCl and 0.45g KCl, as well as glucose and other sugars. What is the concentration of chloride ions in the solution? Report to 3 sig figs. (2 pts)

4) Explain how to prepare 0.750M Na_2CO_3 solution by starting with

a) 1.00M Na_2CO_3 solution,

b) Solid Na_2CO_3. (2 pts)

Optional Textbook Problems: Ch. 4- $4.3 - 4.7$ odd, $4.21 - 4.47$ odd, $4.61 - 4.89$ odd