Genera; Chemistry, 4th edition by Hill, Petrucci, McCreary and Perry

Chapter 2 Problems 33, 37, 57, 62, 63, 68, 72

Chapter 3 Problems 44, 52, 59, 64, 69, 74, 78, 84, 104

1. Silver has two naturally occurring isotopes, one of mass 106.91 amu and the other of mass 108.90 amu. Find the fractional abundances for these two isotopes. The atomic weight is 107.87amu.
2. Determine the volume of NaOH solution needed to prepare 26.2 g of sodium phosphate, Na3PO4, by the reaction

3NaOH(aq) + H3PO4(aq) 🡪 Na3PO4 (aq) + 3H2O(l)

The sodium hydroxide solution has a density of 1.133g/mL and contains 12.0% NaOH by weight.

1. Methyl salicylate, is prepared by heating salicylic acid, C7H6O3, with methanol CH3OH.

C7H6O3 + CH3OH 🡪 C8H8O3  +H2O

In an experiment 1.50g of salicylic acid is reacted with 11.20 g of methanol. The yield of methyl salicylate, C8H8O3, is 1.31g.

1. Determine the limiting reagent if one exists.
2. What is the theoretical yield of C8H8O3 in grams?
3. What is percentage yield?
4. An antacid tablet contains sodium hydrogen carbonate (NaHCO3) and inert ingredients. A 0.400g sample of powdered tablet is mixed with 50.0 mL of 0.150M HCl. The mixture is allowed to stand until the reaction goes to completion.

NaHCO3(s) + HCl(aq) 🡪 NaCl(aq) + H2O(l) +CO2(g)

## The excess HCl was titrated with 46.3 mL of 0.130 M NaOH

HCl(aq) + NaOH(aq) 🡪 NaCl(aq) + H2O(l)

What is the mass percent of sodium hydrogen carbonate in the antacid?

1. A mixture of NaCl and sugar is found to contain 50.0 mass % chlorine. What fraction of the sample is sugar?

