# General Chemistry

Name: _____

**Date: _____ Period: _____**

1. Aspartame is an artificial sweetener that is 160 times sweeter than table sucrose (table sugar) when dissolved in water. It is marketed as NutraSweet. The molecular formula for aspartame is $C_{14}H_{18}N_2O_5$.


   a. Calculate the molar mass of aspartame.
   b. How many moles of molecules are in 10.0 g of aspartame?
   c. How many atoms of nitrogen are in 1.2 g of aspartame?

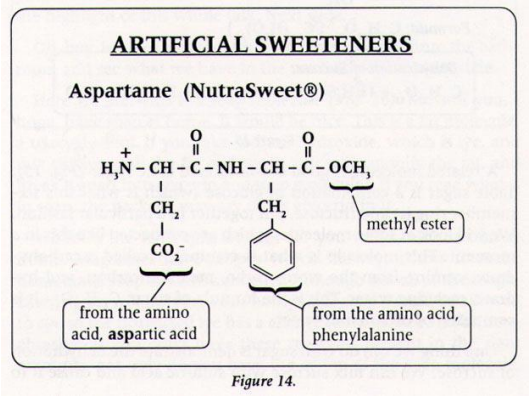
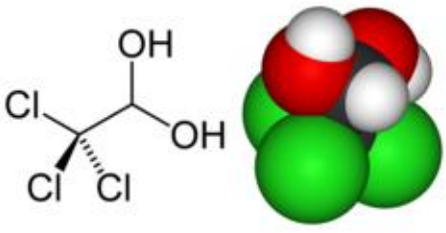


*Figure 14.*

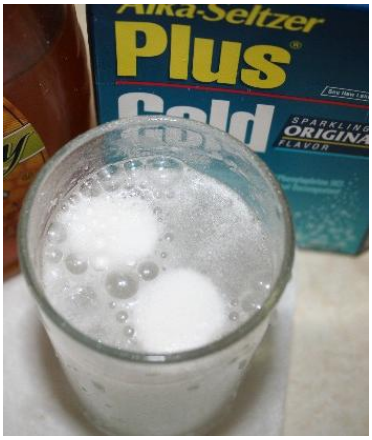
2. Chloral hydrate ($C_2H_3Cl_3O_2$) is a drug formerly used as a sedative and hypnotic. It is the compound used to make "Mickey Finns" in detective stories.
   a. Calculate the mass of chloral hydrate.
   b. How many of Chloral hydrate molecules are in 500.0g of $C_2H_3Cl_3O_2$?
   c. What is the mass in grams of $2.0 \times 10^{-2}$ mol of chloral hydrate?



3. Milk of magnesia (a.k.a. magnesium hydroxide) is often used as an antacid to neutralize excess hydrochloric acid secreted by the stomach.

   Baking soda (a.k.a. sodium bicarbonate) is also used to neutralize the acid by producing sodium chloride, carbon dioxide, and water.

   Which is the more effective antacid per gram?




4. Methanol ($CH_3OH$), also called methyl alcohol, is the simplest alcohol. It is used as a fuel in race cars and is a potential replacement for gasoline. Methanol can be manufactured by combination of gaseous carbon monoxide and hydrogen. Suppose 68.5 kg of CO is reacted with 8.60 kg of $H_2$. Calculate the theoretical yield of methanol?