

Name _____

Daily Problem #11

Analysis of the artificial sweetener aspartame gives the following composition (by weight):

%C	57.14
%H	6.16
%N	9.52
%O	27.18

The formula weight of aspartame is found (in a separate experiment) to be between 250 and 300 g/mole. Determine the molecular formula of aspartame. **Show all work.**

empirical formula: $C_{14}H_{18}N_2O_5$
molecular formula: $C_{14}H_{18}N_2O_5$

Daily Problem #12

Gasoline consists primarily of octane, C_8H_{18} .

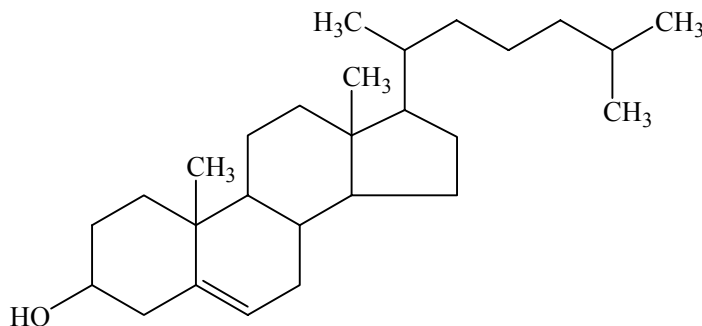
Calculate the mass of water produced from the combustion of 3.79 L (1.00 gallon) of gasoline (octane) (density = 0.756 g/mL) with excess O_2 .

Combustion = combination with oxygen. See Table 3.2, page 104 for an example.

4.07 kg H_2O

Daily Problem #13

A blood serum cholesterol level greater than 240 **mg of cholesterol per deciliter** of blood usually suggests the need for medical intervention.



If a patient has a serum cholesterol ($C_{27}H_{46}O$) level of 247 mg/dL, calculate the concentration in terms of **molarity (M)**.

$6.39 \times 10^{-3} \text{ M } C_{27}H_{46}O$