## **Some Chemical Equation Balancing Examples**

All the following examples burn hydrocarbons with oxygen to obtain energy.

Hydrogen:  $2H_2+O_2 \Rightarrow 2H_2O+\text{energy}$ 

(This made our explosion. The reverse of this is electrolysis.)

Methane:  $CH_4+2O_2 \Rightarrow CO_2+2H_2O+energy$ 

(Used for home heating and in some buses and delivery vehicles.)

Ethane:  $2C_2H_6+7O_2 \Rightarrow 4CO_2+6H_2O+energy$ 

(You must double ethane to get integer number of O2's.)

Ethyl alcohol:  $C_2H_5OH+3O_2\Rightarrow 2CO_2+3H_2O+energy$ 

(Don't forget about the O in ethyl alcohol.)

Octane:  $2C_8H_{18} + 25O_2 \Rightarrow 16CO_2 + 18H_2O + \text{energy}$ 

(A minor component of gasoline.)

Sucrose:  $C_{12}H_{22}O_{11}+12O_2 \Rightarrow 12CO_2+11H_2O+energy$ 

(Ordinary table sugar. Watch out for the O's in the sugar.)

Typical Triglyceride:  $C_{55}H_{104}O_6 + 78O_2 \Rightarrow 55CO_2 + 52H_2O + energy$ 

(Average fat molecule. Watch out for the O's in the triglyceride.)

Burning without sufficient oxygen will produce carbon monoxide, a deadly odorless gas, instead of carbon dioxide. It is a source of air pollution.

Methane:  $2CH_4+3O_2 \Rightarrow 2CO+4H_2O+energy$ 

Octane:  $2C_8H_{18} + 17O_2 \Rightarrow 16CO + 18H_2O + energy$ 

In these and all chemical equations, atoms are simply rearranged, not added or lost.