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: $CH_4 + 2O_2 \Rightarrow CO_2 + 2H_2O + \text{energy}$

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

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

(You must double ethane to get integer number of O_2's.)

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

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

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

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

(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: $2CH_4 + 3O_2 \Rightarrow 2CO + 4H_2O + \text{energy}$

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

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