It is sunlight in modified form which turns all the windmills and water wheels and the machinery which they drive. It is the energy derived from coal and petroleum (fossil sunlight) which propels our steam and gas engines, our locomotives and automobiles. ... Food is simply sunlight in cold storage.

John Harvey Kellogg

Arizona State University
SES 194

Energy in Everyday Life

Chemical Energy

Frank Timmes

ftimmes@asu.edu

Chemical energy plays a crucial role in each and every one of our daily lives.

Through chemical reactions, the breaking and forming of chemical bonds, energy can be extracted and harnessed in a usable fashion.

Many of the chemical compounds used to produce energy involve burning - oxidation reactions.

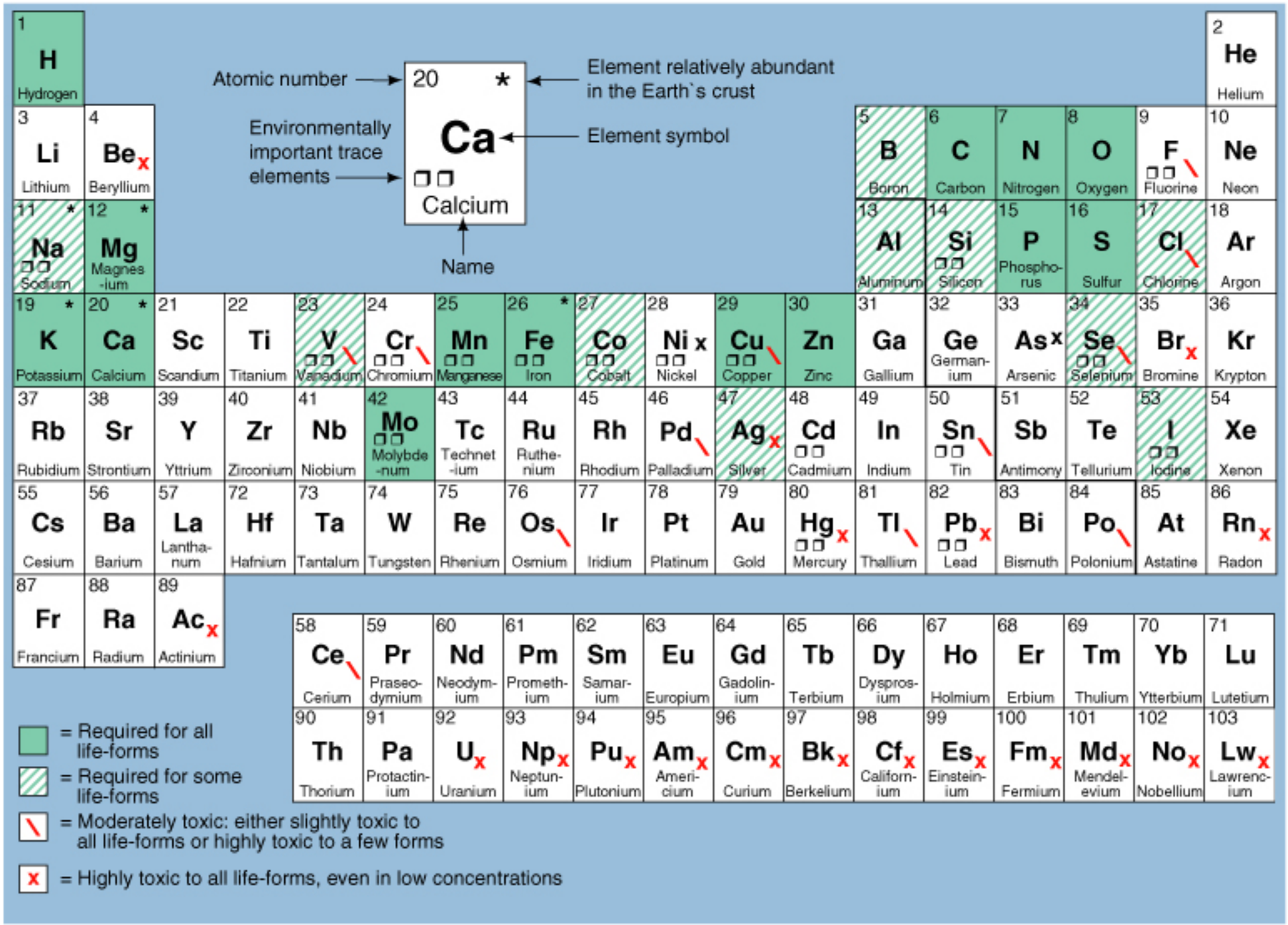
Gasoline powers most automobiles and trucks, kerosene serves as jet fuel. Natural gas, coal and oil are burned to heat our homes and produce electricity.

CHEMICAL ENERGY STORAGE

The root source of the energy used for heating, transportation, and industry in most of the world is chemical energy.

Chemical energy is also the basis for the processes of life.

For example, the chemical energy in “food” is converted by organisms into mechanical energy and heat.



Chemical reactions involve the making and breaking of chemical bonds.

The chemical energy of a system is the energy released or absorbed due to the making and breaking of these bonds.

Breaking bonds absorbs energy.
Forming bonds releases energy.