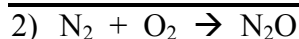

Notes and Practice Problems- Conservation of Mass- Balancing Chemical Equations

The balancing of chemical equations has an important environmental message for us. If atoms are conserved in a chemical reaction, then we cannot get rid of them. In other words *we cannot throw anything away*. There are only two things we can do with atoms: move them from place to place or from compound to compound. Thus when we "dispose" of something by burning it, dumping it, or washing it down the sink, we have not really gotten rid of it at all. Discarded atoms and molecules in places where we do not want them are known as pollution. These atoms and molecules are still around someplace, perhaps in the soil, in the flesh of an animal that we may eat, or in the atmosphere.

The following chemical equations *are not balanced*. Your instructor will model how to balance some of the following equations. Some of the others are in your problem set.



CH_4 is the chemical formula for methane. Methane is a fossil fuel that is highly combustible because it is a hydrocarbon. It is a primary component of natural gas; a fuel used to power cars and generate electricity.



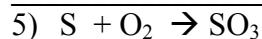
Atmospheric oxygen and nitrogen gas (diatomic oxygen and nitrogen) chemically react with auto exhaust to create N_2O , nitrous oxide, which is one of the major components of smog. N_2O , nitrous oxide is also a greenhouse gas that contributes to global warming.



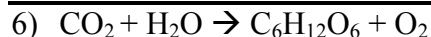
The product of this reaction is ammonia. Ammonium ions are important to in the nitrogen cycle, which provides nutrients to plants. This reaction is known as nitrogen fixation and the mechanism by which nitrogen is taken from the atmosphere and incorporated into plants.



C_2H_6 is the chemical formula for ethane. Ethane is a fossil fuel that is highly combustible because it is a hydrocarbon. It is sometimes used as component of natural gas; a fuel used to power cars and generate electricity.



SO_3 , Sulfur trioxide in the gaseous form, it is a significant pollutant, being the primary agent in acid rain. Sulfur compounds are released into the atmosphere from burning coal to generate electricity.



Atmospheric CO_2 , carbon dioxide reacts with water in the process of photosynthesis producing $\text{C}_6\text{H}_{12}\text{O}_6$, glucose (plant food) and O_2 , oxygen that is released back into the environment.
