

Textbook Page 365 #1, 3, 4

1.
 - (a) Copper readily reacts with carbon dioxide and water in the environment (**nature of the reactant**).
 - (b) The lower **temperature** slows the biochemical reactions that spoil milk.
 - (c) The coal dust has greater **surface area** in contact with oxygen.
 - (d) Magnesium is a very reactive metal (**nature of reactant**).
 - (e) Zeolite is a **catalyst** for the "cracking" of hydrocarbons.
 - (f) Hydrogen peroxide at a higher **concentration** reacts faster with skin.
 - (g) At a lower **temperature**, the chemical reaction that produces light in a glow stick will consume the reactants slower.
 - (h) The high **temperature** of a spark or open flame can cause the oxidation of the fuel to occur fast enough to become self-sustaining (i.e., the fuel ignites).
 - (i) Flour dust has a large **surface area** in contact with oxygen and can burn quickly (explode) if ignited.
 - (j) Lack of the biological **catalyst** (enzyme) slows the chemical reaction that digests phenylalanine.

3. To decrease the rate of a chemical reaction by a factor of four, the chemist should decrease the temperature of the reactants by about 20°C. Reaction rates are typically halved by each 10°C drop in temperature.

4. Enzymes are catalysts and are not consumed by biochemical reactions. Therefore, enzymes can be reused making large quantities unnecessary.