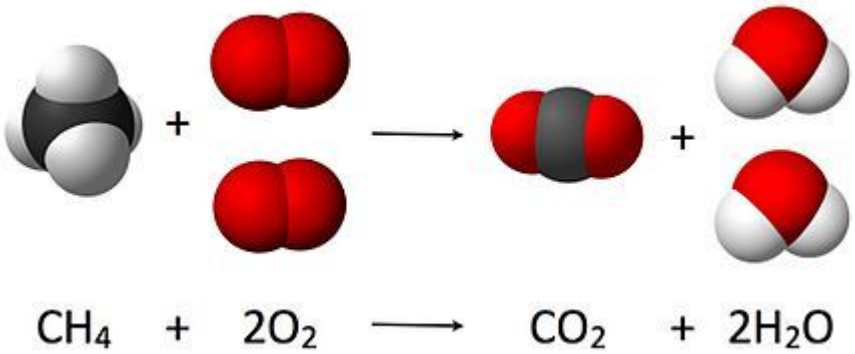
Reaction Rates

Topic 8

What is a reaction

- A reaction occurs because particles are violently colliding
- These collisions can force particles apart or bond them together
- These collisions take energy
- When you stir a reaction, you increase these collisions
- Adding heat adds energy to the reaction

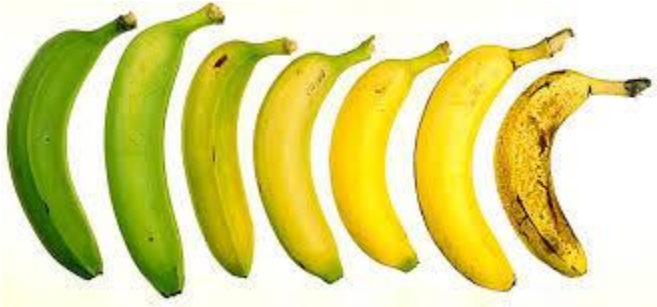


$CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$

Rates

- The rate of a reaction is a measure of how fast a reaction occurs
- You can measure how quickly a reactant disappears or how fast a product appear

Ex. You can slow the rate that a banana goes bad by wrapping the stem in plastic wrap

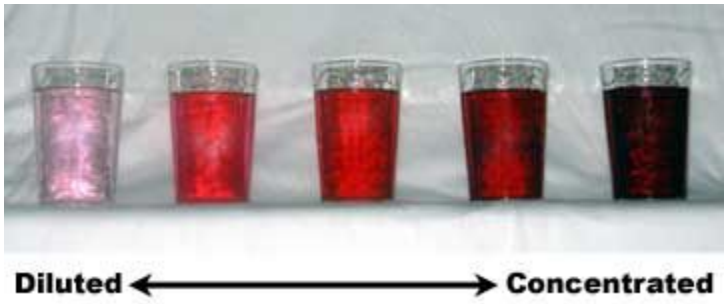


Speeding up a reaction

5 ways to speed up a reaction

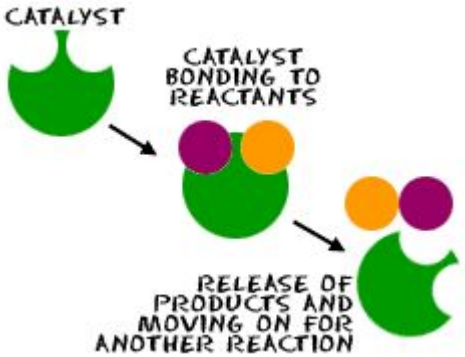
- Heat up reaction
- Add a catalyst
- Decrease the size of the chemicals involved
- Increase the concentration of chemicals involved
- Stir the reaction

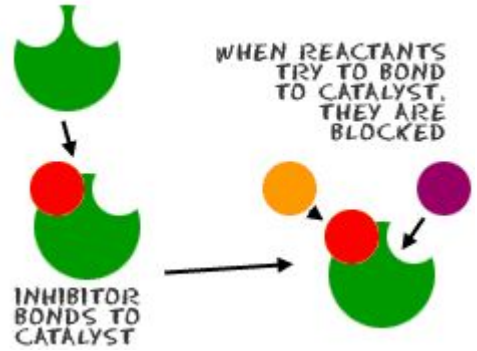
- Decreasing the size of a chemical allows there to be more surface area, which means more collisions
- Adding more chemicals MAY mean a faster reaction, but this is not guaranteed
- Reactions happen in a set ratio, regardless of the amount of chemicals
- There is a max concentration of chemicals in a reaction



Catalysts

- Catalysts speed up reactions by making collisions easier to set up, or by lowering the energy needed to create a collision
- **Enzymes** are natural catalysts, often found in our mouths, stomachs and bodily fluids such as tears
- The opposite of a catalyst is an **inhibitor,** which slows down a chemical reaction



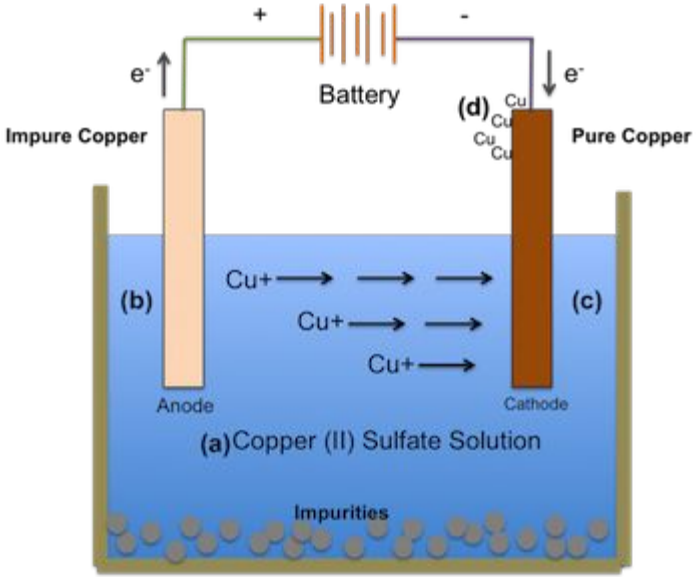


Types of Reactions

- Corrosion is the oxidation of metals or rocks, when they are exposed to air and moisture
- Rust is an example of corrosion

Prevention

- We can prevent corrosion by applying a thin layer of zinc to the metal, which makes it more resistant to corrosion - known as galvanization
- To apply the zinc, electrolysis can bond the two metals together



Combustion

- Combustion is an exothermic reaction with oxygen
- Combustion requires heat, oxygen and fuel
- If there is no oxygen, a fire can not continue
- Combustion reactions always produce steam and energy

Homework

Page 164

1,3,4,5,6

Page 170 - Do this after the quiz on Monday

2,3,4,7,8,9,10,11