

# Oxidation Numbers



"Wait, wait, before you mix them, you have to say, 'Pow!'."



- Oxidation numbers indicate the number of electrons lost or gained as a result of chemical bonding

# Oxidation



- increase in oxidation number
- loss of electrons

# Reduction



- decrease in oxidation number
- gain of electrons

# Rules to Remember!



- The oxidation number of a free element is always 0



- The oxidation number of a monatomic ion equals the charge of the ion



- The usual oxidation number of hydrogen is  $1+$



- The oxidation number of oxygen is usually 2-





- The oxidation number for group 1 element (alkali metals) is  $1+$



- The oxidation number of a group II element (alkali earth metals) is  $2+$



- the oxidation number of a halogen is 1- except when that element is combined with one having a higher electronegativity



- The sum of the oxidation numbers in a neutral compound is 0



- The sum of oxidation numbers in a polyatomic ion is equal to the charge of the ion

# Example

- Determine the oxidizing and reducing agents using oxidation numbers for photosynthesis



## Example 2

