

# Oxidation reduction reactions

Profession



**ASSIGN  
BUSTER**

What is the difference between an oxidizing agent and a reducing agent?

The oxidation number (overall charge of the atom) is reduced in reduction and this is accomplished by adding electrons. The electrons, being negative, reduce the overall oxidation number of the atom receiving the electrons.

Oxidation is the reverse process: the oxidation number of an atom is increased during oxidation.

This is done by removing electrons. The electrons, being negative, make the atom that lost them more positive. When first learning to balance equations, we learned that the number of atoms of each element in the products and reactants must be equivalent. What are some additional factors that must be taken into account when balancing equations for redox reactions?

Some additional factors that must be taken into account when balancing equations for redox reactions are: dividing the equation into an oxidation half-reaction and a reduction half reaction, multiplying each half-reaction by an integer such that the number of electrons lost in one equals the number gained in the other, and combining the half-reactions then cancel. What are half reactions? A half- reaction is simply one which shows either reduction OR oxidation, but not both. What two aspects of the half-reaction equations must be balanced?

Oxidation and reduction charges 5. For the equation  $\text{Ag} + \text{NO}_3^- \rightarrow \text{Ag}^+ + \text{NO}$  (Note: This reaction takes place in an acidic solution. ) Step 1: What substance is reduced?  $\text{NO}_3^-$  Step 2: What substance is oxidized?  $\text{Ag}$  Step 3: What is the half reaction for oxidation?  $\text{Ag} \rightarrow \text{Ag}^+ + 1\text{e}^-$  Step 4: What is the half reaction for reduction?  $(\text{NO}_3)^- + 4\text{H}^+ + 3\text{e}^- \rightarrow \text{NO} + 2\text{H}_2\text{O}$  Step 5: What is

the net balanced equation?  $3e^- + 3Ag + 4H^+ + NO_3^- \rightarrow 3Ag^+ + NO + 2H_2O +$

$3e^-$  Step 6: What is the reduced equation?  $3Ag + 4H^+ + NO_3^- \rightarrow NO +$

$2H_2O + 3Ag$