

Oxidation - Reduction Reactions

Oxidation originally referred to a substance gaining oxygen in a chemical reaction.

Reduction originally referred to a substance losing oxygen in a chemical reaction.

Oxidation and reduction always occur simultaneously.

These concepts have now been extended to reactions not involving oxygen.

Oxidation - complete or partial loss of electrons

Reduction - complete or partial gain of electrons

Lose

Electrons

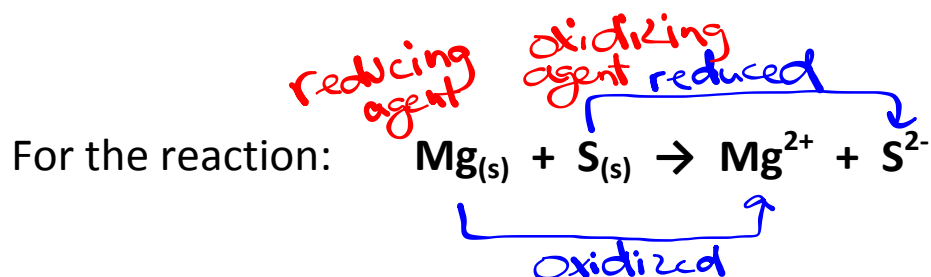
Oxidize

Gain

Electrons

Reduce

Redox Reactions forming Ions

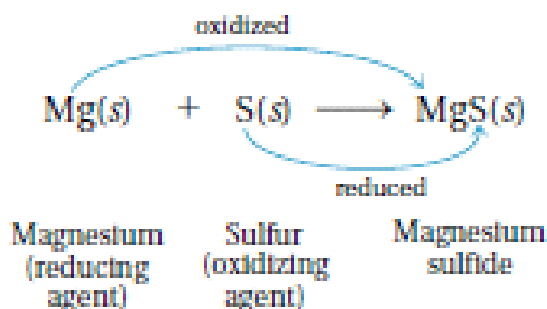


the movement of electrons can be represented by the following processes:



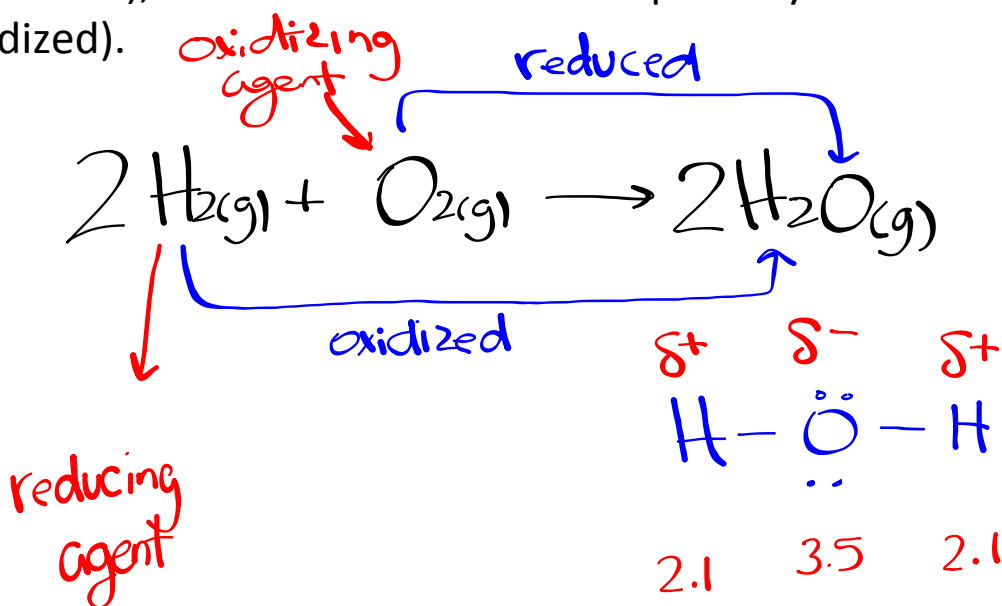
The substance that loses the electrons is called the **reducing agent**. In this case, magnesium causes sulfur to gain the electrons so magnesium is called the reducing agent.

The substance that accepts the electrons is called the **oxidizing agent**. Sulfur causes magnesium to lose the electrons, so sulfur is called the oxidizing agent.



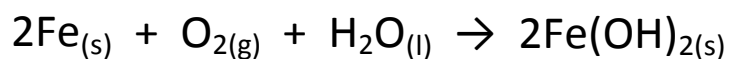
Redox with Covalent Compounds

Because electrons are shared between atoms in covalent compounds, the electronegativities of the atoms are compared to determine which substance has partially gained electrons (reduction), and which substance has partially lost electrons (oxidized).



Corrosion

When metals corrode, they are being oxidized to ions of that metal in the presence of air (oxygen).



Fe is forming Fe^{2+} (oxidation)

O and H are forming an anion (reduction)

Homework

p. 638 #1-7