

electrochemistry - the study of electricity -related applications of oxidation - reduction reactions

oxidation numbers -

- numbers assigned to the elements in a chemical reaction that give the apparent charge of the elements.
- In ionic compounds - oxidation # = true charge
- In molecular compounds - oxidation # is based on electron distribution
- Oxidation #'s are written with the sign first and then the number

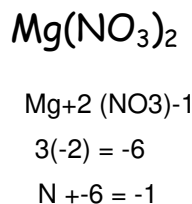
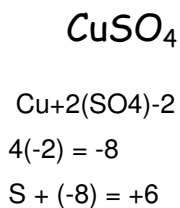
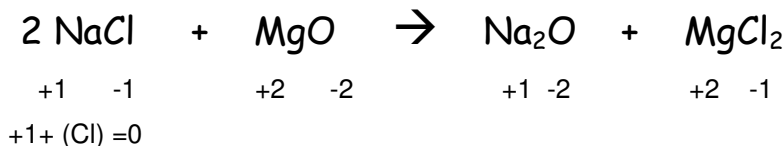
Rules For Assigning Oxidation Numbers:

situation	oxidation #
<u>uncombined element</u>	<u>0</u>
<u>sum in a compound</u>	<u>0</u>
<u>sum in a polyatomic ion</u>	<u>charge on ion</u>

elements in a compound:

fluorine	-1
oxygen	-2
hydrogen	+1
group 1	+1
group 2	+2
Aluminum	+3

Example:





An oxidation - reduction reaction (Redox reaction) is any reaction in which atoms or ions undergo a change in oxidation number.

Is this a redox reaction? $2 \text{Na}^0 + \text{Cl}_2^0 \rightarrow 2 \text{NaCl}^{+1-1}$ Redox Reaction

When an atom or ion in a reaction has an increase in oxidation number, it has undergone the process of oxidation by losing 1 or more electron.

The oxidation # of Na went from 0 to +1, so Na was oxidized.

When an atom or ion in a reaction has a decrease in oxidation number, it has undergone the process of reduction by gaining 1 or more electron.

The oxidation # of Cl went from 0 to -1, so Cl was reduced.

LEO says GER

losing electrons - oxidized gaining electrons - reduced

Chemistry Assignment #3: On Assignment #2, draw circles around the reactants that are oxidized and squares around those that are reduced.

3 Types of Redox Reactions:

#1 Electron exchange happens directly, as the chemicals come in contact.

#2 Electron exchange is forced, using electricity. This is called electrolysis.

#3 The chemicals are separated so that electron exchange occurs only when the electrons move through a wire, producing electricity.

Chemistry Quiz:

1. _____ 2. _____ 3. _____ 4. _____ 5. _____

CR 1 _____ CR 2 _____