

electrochemistry - the study of \_\_\_\_\_-related applications of \_\_\_\_\_ - \_\_\_\_\_ reactions

oxidation numbers -

- numbers assigned to the \_\_\_\_\_ in a chemical \_\_\_\_\_ that give the \_\_\_\_\_ charge of the \_\_\_\_\_.
- In ionic compounds - oxidation # = \_\_\_\_\_
- In molecular compounds - oxidation # is based on \_\_\_\_\_
- Oxidation #'s are written with the \_\_\_\_\_ first and then the \_\_\_\_\_.

Rules For Assigning Oxidation Numbers:

situation	oxidation #

elements in a compound:


Example:



An \_\_\_\_\_ - \_\_\_\_\_ reaction ( \_\_\_\_\_ reaction) is any reaction in which atoms or ions undergo a \_\_\_\_\_ in \_\_\_\_\_.

Is this a redox reaction?  $2 \text{Na} + \text{Cl}_2 \rightarrow 2 \text{NaCl}$  \_\_\_\_\_

When an \_\_\_\_\_ or \_\_\_\_\_ in a reaction has an \_\_\_\_\_ in \_\_\_\_\_ number, it has undergone the process of \_\_\_\_\_ by \_\_\_\_\_ 1 or more \_\_\_\_\_.

The oxidation # of Na went from \_\_\_\_\_ to \_\_\_\_\_, so Na was \_\_\_\_\_.

When an \_\_\_\_\_ or \_\_\_\_\_ in a reaction has a \_\_\_\_\_ in \_\_\_\_\_ number, it has undergone the process of \_\_\_\_\_ by \_\_\_\_\_ 1 or more \_\_\_\_\_.

The oxidation # of Cl went from \_\_\_\_\_ to \_\_\_\_\_, so Cl was \_\_\_\_\_.

LEO says GER

\_\_\_\_\_ electrons - \_\_\_\_\_      \_\_\_\_\_ electrons - \_\_\_\_\_

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 \_\_\_\_\_, as the chemicals come in \_\_\_\_\_.

#2 Electron exchange is forced, using \_\_\_\_\_. This is called \_\_\_\_\_.

#3 The chemicals are \_\_\_\_\_ so that \_\_\_\_\_ exchange occurs only when the electrons move through a \_\_\_\_\_, producing \_\_\_\_\_.

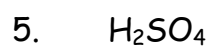
Chemistry Quiz:

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_ 5. \_\_\_\_\_  
CR 1 \_\_\_\_\_ CR 2 \_\_\_\_\_

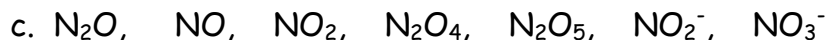
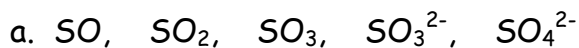
**Worksheet: Chemistry Assignment 1—  
Episode 1401**

Name \_\_\_\_\_

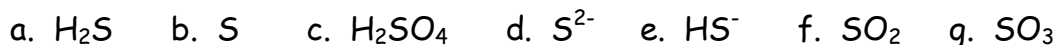
Assign an oxidation number to each element:



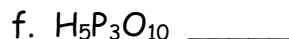
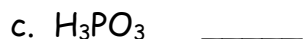
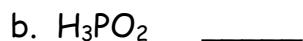
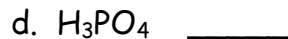
1. Give the oxidation numbers of all the elements in the following molecules and ions:



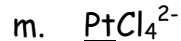
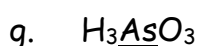
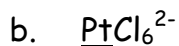
2. Determine the oxidation number of the sulfur atom:



3. Indicate the oxidation number of phosphorus in each of the following compounds:



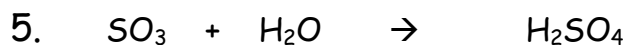
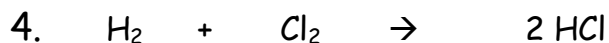
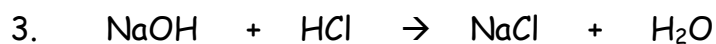
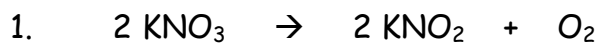
4. Give oxidation numbers for the underlined atoms in these molecules and ions:



**Worksheet: Chemistry Assignment 2—  
Episode 1401**

Name \_\_\_\_\_

Determine if each of the following are redox reactions. To do this, assign oxidation numbers to each element. Remember that redox reactions are any reaction where an element \_\_\_\_\_.



- The purpose of assigning oxidation numbers is to keep track of the loss and gain of \_\_\_\_\_ in redox reactions. Fill in these blanks about oxidation numbers:
  - The oxidation number of an element in its **atomic** state is \_\_\_\_\_.
  - The oxidation number of an **ion** is its \_\_\_\_\_.
  - In a compound, the total of all the oxidation numbers of the elements is \_\_\_\_\_.
  - In a polyatomic ion, the total of all the oxidation numbers of the elements is \_\_\_\_\_.
  - In a compound, the oxidation number of H is usually \_\_\_\_\_ and of O is usually \_\_\_\_\_.
  - In a compound, the oxidation number of elements in group I of the periodic table is \_\_\_\_\_ and of elements in Group II is \_\_\_\_\_.
- Give the oxidation number of sulfur in each of the following:



- Assign an oxidation number to each element in these equations: (The equations are balanced, but the coefficients do not affect oxidation numbers.)
  - $2 \text{Al} + 3 \text{Cu}_2\text{O} \rightarrow 6 \text{Cu} + \text{Al}_2\text{O}_3$
  - $\text{HBr} + \text{NaOH} \rightarrow \text{NaBr} + \text{H}_2\text{O}$
- Which of the equations above represents a redox reaction? \_\_\_\_\_  
How can you tell?
- When an element is oxidized, it (gains, loses) electrons, and its oxidation number (increases, decreases).
- When an element is reduced, it (gains, loses) electrons, and its oxidation number (increases, decreases).

7. In this reaction:  $4 \text{K} + \text{O}_2 \rightarrow 2 \text{K}_2\text{O}$   
\_\_\_\_\_ is oxidized and \_\_\_\_\_ is reduced.

8. There are three types of redox reactions. From these descriptions, choose the type -  
**direct** exchange of electrons when chemicals come in contact  
**forced** exchange of electrons using electric current  
**indirect** exchange of electrons through a wire

a. A copper wire is placed in a solution of  $\text{AgNO}_3$ . Silver comes out of solution, and the solution turns blue, showing that Cu is going into solution. \_\_\_\_\_

b. A battery is an example of this type of redox reaction.  
\_\_\_\_\_

c. When a strip of aluminum is placed in a solution of magnesium chloride, no reaction takes place. But when the aluminum is attached to the negative pole of a battery, a strip of magnesium is attached to the + pole, and the strips are placed in the solution, a reaction occurs.  
\_\_\_\_\_

9. The forced exchange of electrons using electric current is called  
\_\_\_\_\_.