ELECTROCHEMISTRY

THE OXIDATION NUMBER

- Oxidation Number Rules:
- The oxidation number of any pure element is 0.
- The oxidation number of a monatomic ion equals that charge on the ion.
- The more electronegative element in a binary compound is assigned the number equal to the charge it would have if it were an ion.
- The oxidation number of fluorine in a compound is always -1.
- Oxygen has an oxidation number of -2 unless it is combined with F, in which it is +1 or +2, or it is in peroxide (such as H_2O_2 or Na_2O_2), in which it is -1.
- Hydrogen is +1, unless combined with a metal, and then it is -1.
- In compounds, Group 1 is +1, Group 2 is +2, and Aluminum is +3.
- The sum of the oxidation numbers of all atoms in a neutral compound is 0.
- The sum of the oxidation numbers in a polyatomic ion equals the charge of the ion.

ACTIVITY 1

- . S in HSO_4^- _____
-
- Cl in $Fe(ClO_2)_3$ _____
-
- Fe in $Fe(ClO_2)_3$ _____
-

. N in NO_3^- **2**

ACTIVITY 2

- $2\ Cr^{+} + Sn^{4+} \rightarrow 2\ Cr^{3+} + Sn^{2+}$
-
- Oxidized:_____ Reduced:_____
-
- $3\ Hg^{2+} + 2\ Fe\ (s) \rightarrow 3\ Hg_2 + 2\ Fe^{3+}$
-
- Oxidized:_____ Reduced:_____
-
- $2\ As\ (s) + 3\ Cl_2\ (g) \rightarrow 2\ AsCl_3$.
-
- Oxidized:_____ Reduced:_____

- study of the interchange between chemical change and electrical work

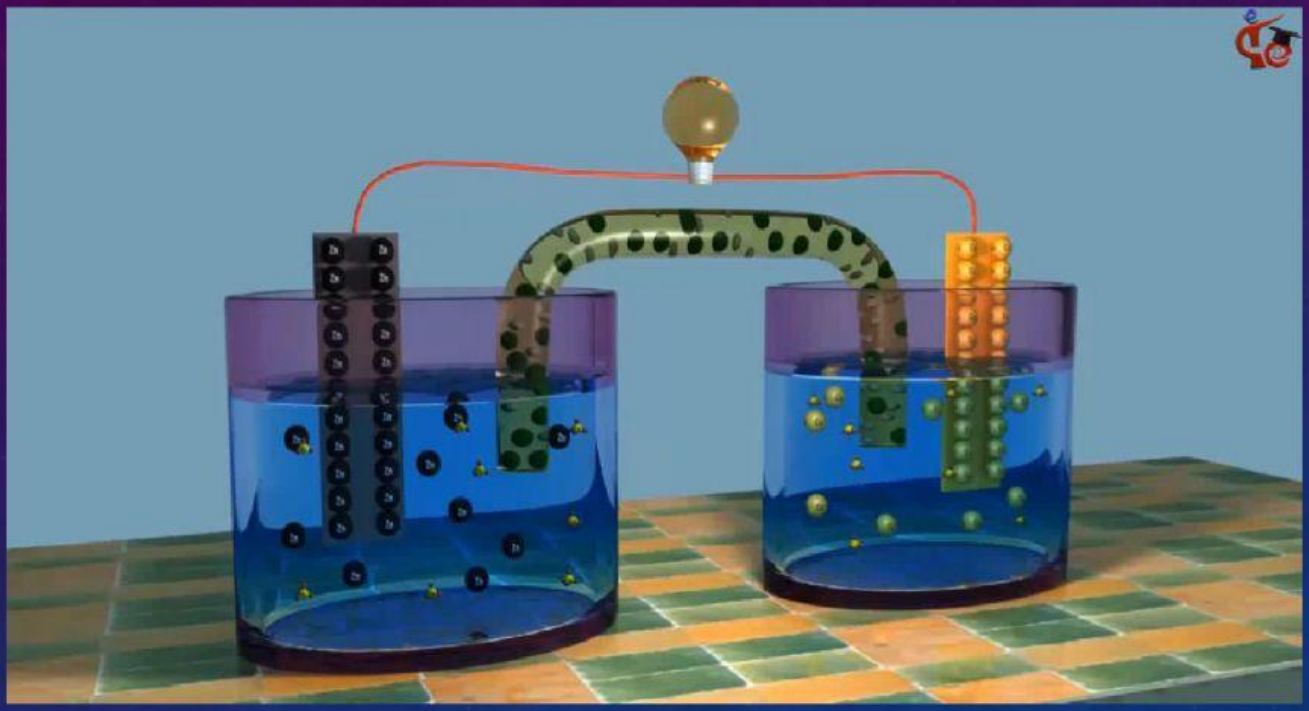
- **Electrochemical cells:**
- systems utilizing a redox reaction to produce or use electrical energy

Voltaic (galvanic) cells:

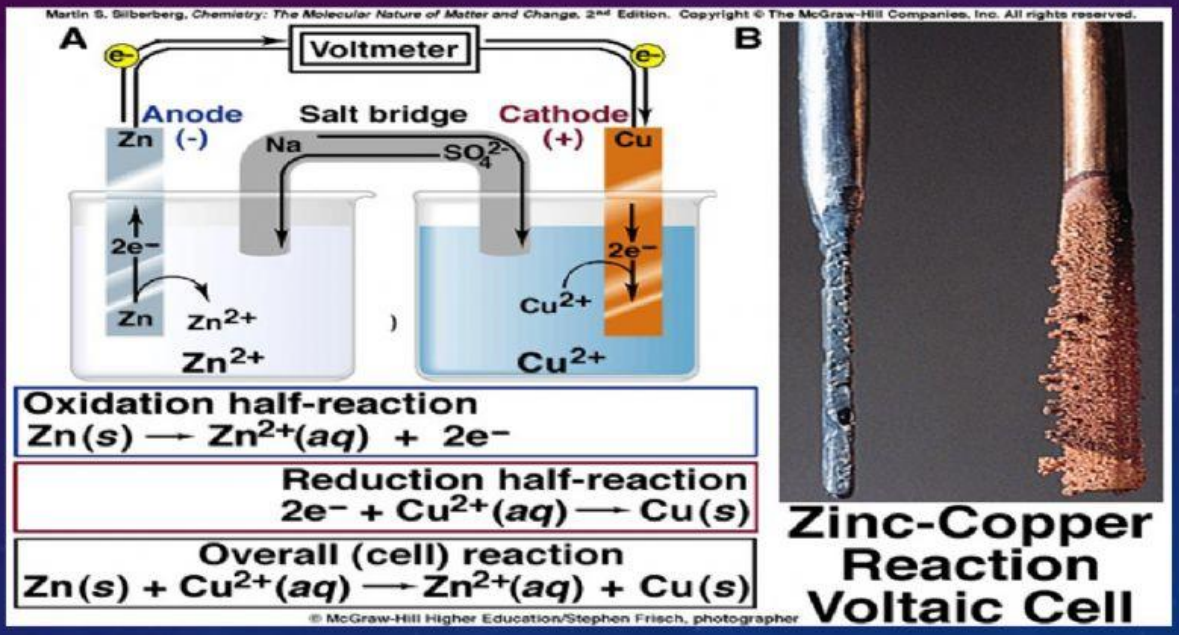
a spontaneous reaction generates electrical energy

Electrolytic cells:

absorb free energy from an electrical source to drive a nonspontaneous reaction



ACTIVITY 3

1- what are the composition of the galvanic cell?
2- determine the anode , cathode and their charges?
3- what is the role of the salt bridge ?
4- Write the over all reaction of the galvanic cell?

GALVANIC CELL **VOLTAIC**