**Topic 9– Electrochemistry**

**9.1 – Oxidation and Reduction**

**Redox reactions**

Oxidation – historically, gain of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or loss of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Reduction – historically, loss of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or gain of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Example: Fe(s) + O2(g) 🡪 Fe2O3(s)

**Current definition:**

Oxidation =

Reduction =

**LEO the lion says GER**

**OIL RIG**

**Example of a redox reaction:**

Cu(s) + AgNO3(aq) 🡪 Cu(NO3)2(aq) + Ag(s)

Ionic Equation:

Net Ionic Equation:

Oxidation =

Reduction =

Oxidizing agent – a substance which causes something else to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* An oxidizing agent is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ during the reaction

Reducing agent – a substance which causes something else to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* A reducing agent is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ during the reaction

Analogy – wet person + dry towel =

How can you tell what is being oxidized or reduced?

* A species being oxidized becomes more positively charged (its oxidation number\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
* A species being reduced becomes less positively charged (its oxidation state \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

Oxidation and Reduction must occur together – similar to B-L acid/base reactions

* There is always one oxidation and one reduction
* Each can be written as a half reaction
* To balance a redox reaction, one or both half reactions might need to be multiplied so that the number of electrons lost is equal to the number of electrons gained.

Example #1. Br2(l) + Ag(s) 🡪 2 Br- + Ag+

Example #2 Pb+2 + Cr(s) 🡪 Pb(s) + Cr+3