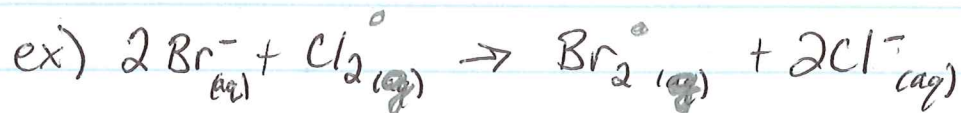


19-1 Oxidation & Reduction Reaction (Redox)

* We will use net ionic equations to determine what chemical interactions have taken place w/ electrons

- When electrons are transferred from one substance to another we call it a redox reaction (or reduction oxidation reaction).



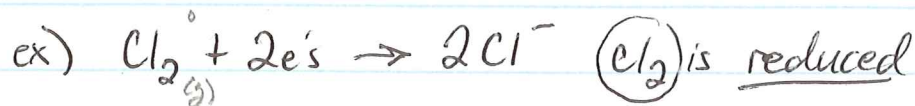
* Notice ions become molecules, and molecules become atoms when electrons are exchanged.

Chlorine molecule takes electrons from Bromine to become a negative ion & bromine loses electrons and becomes a molecule. - This is redox

Oxidation = loss of electrons to another substance



Reduction = gaining of electrons from another substance



Oxidation & Reduction are complementary processes
 - one makes the other happen & vice versa

Some ^{acronym} mnemonic devices to help you remember:

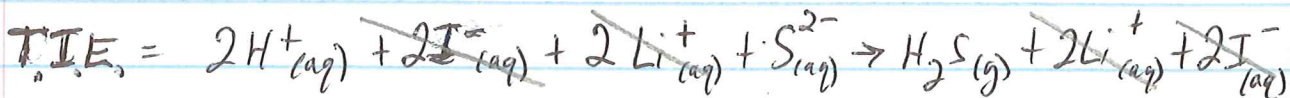
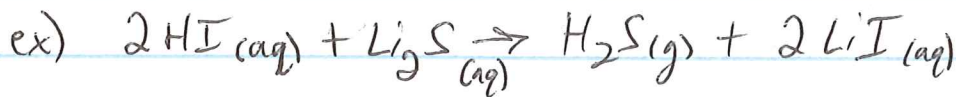
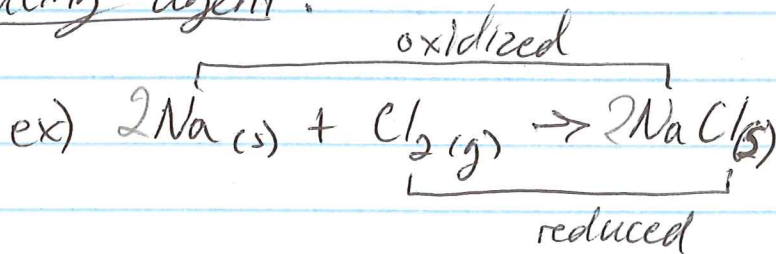
LEO says GER $\left\{ \begin{array}{l} \text{Loss of electrons} = \text{oxidation} \\ \text{gaining of electrons} = \text{reduction} \end{array} \right.$

or OIL - RIG $\left\{ \begin{array}{l} \text{oxidation is } \underline{\text{Losing}} \\ \text{reduction is } \underline{\text{gaining}} \end{array} \right.$

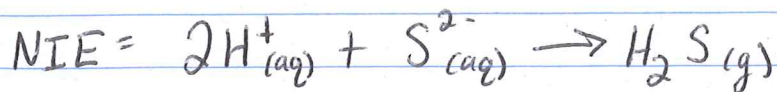
Oxidizing & Reducing Agents

- In an oxidation reaction, the substance that accepts the electrons is known as the oxidizing agent (what is reduced)

- In a reduction reaction, the substance that loses the electrons (what is oxidized) is the reducing agent.



(3)



What is Red. rxn? $2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$ (+ \rightarrow 0)

What is Ox rxn? $\text{S}^{2-} \rightarrow \text{S}_{(\text{g})} + 2\text{e}^-$ (2- \rightarrow 0)

to determine if oxidation or reduction has occurred -
study the oxidation state of each atom involved.



- elements that do NOT have an oxidation state are
said to have an ox-state of zero or Zn^0 .

so, to go from $\text{Zn}^{2+} \rightarrow \text{Zn}^0$ is a gain of electrons
or reduction & reverse $\text{Zn}^0 \rightarrow \text{Zn}^{2+}$ is an oxidation

* If #'s go up = oxidation, down = reduction

ex) what kind of reaction is $\text{H}_2_{(\text{g})} \rightarrow 2\text{H}^+_{(\text{aq})}$?

oxidation (0 \rightarrow +)

what kind of reaction is $\text{Na}^+ \rightarrow \text{Na}_{(\text{s})}$?

reduction (+ \rightarrow 0)

what kind of reaction is $\text{Fe}^{2+} \rightarrow \text{Fe}^{3+}$?

oxidation (2+ \rightarrow 3+)