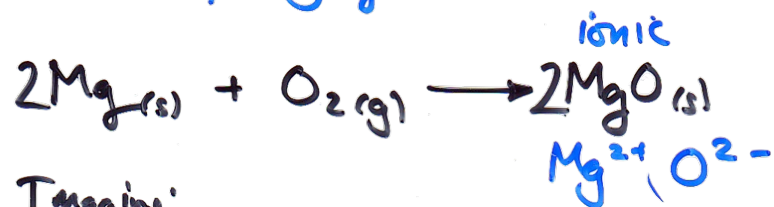


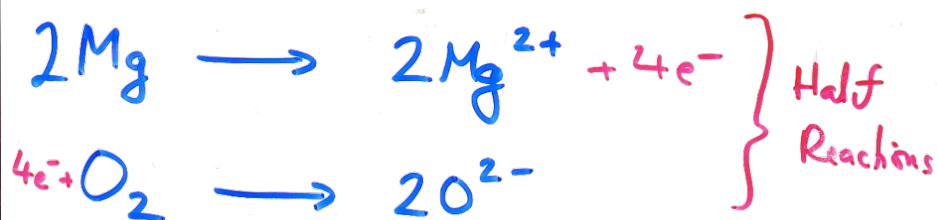
Oxidation - Reduction (Redox) Reactions

e^- transfer rxns.

Batteries / Aging



Imagine:



Oxidation = Loss of e^- s

Mg was oxidized

O_2 was the oxidizing agent

O_2 caused Mg to be oxidized

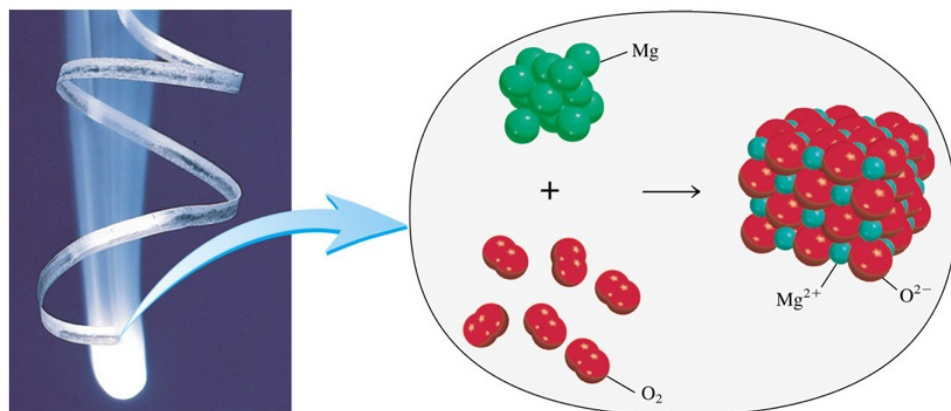
Reduction = Gain of e^- s

O_2 was reduced

Mg caused O_2 to be reduced.

Mg was the reducing agent

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There is a fool-proof method for determining the substance that was ox/red.

OIL RIG Ox. is loss (e^-)
red. is gain (e^-)

LEO goes GER loss of electrons is oxidation
gain of electrons is reduction

We have to assign an OXIDATION NUMBER (O.N., ox.#) to each atom in substance.

Substances that have atoms that increase in ox # are OXIDIZED

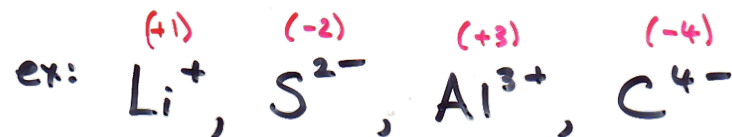
Substances that have atoms that decrease in ox # are REDUCED.

Rules

(1) Atoms in element = 0



(2) Atoms in monatomic ions = Charge



charge: # ± ox.#: ±#

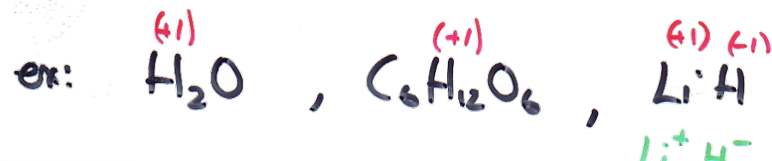
(3) Oxygen in cpds = -2

but in H_2O_2 and O_2^{2-} = -1

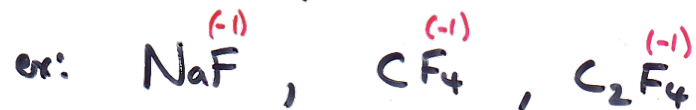


(4) Hydrogen in cpds = +1

(= -1 in metal hydrides)



(5) Fluorine in cpds = -1

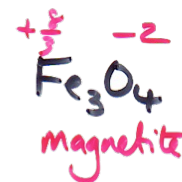
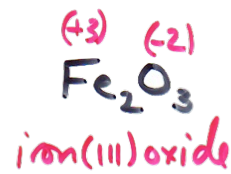
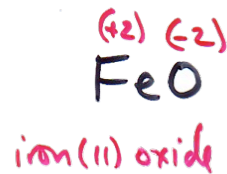
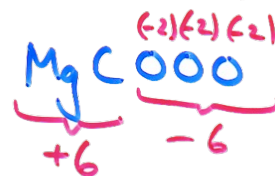
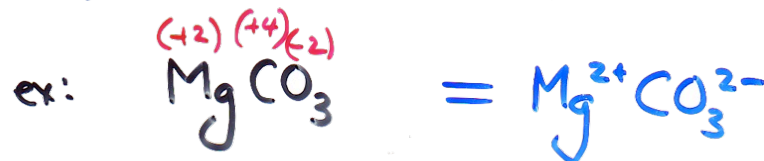
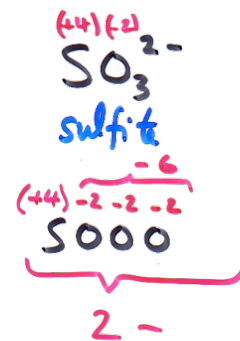
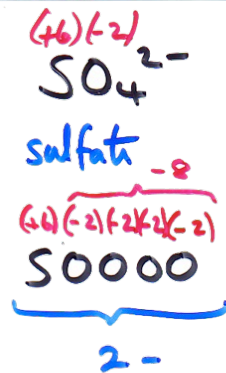
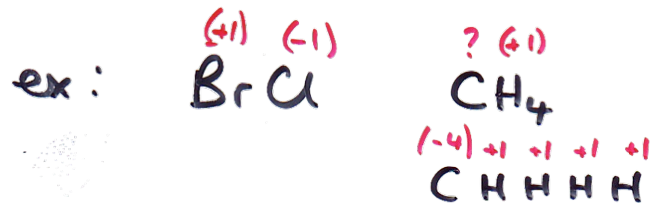


Halogens in cpds are often -1,
unless they're combined w/ O or F



highest halogen in PT = -1

(6) Sum of ox #'s for each atom
in substance = CHARGE.



ex:



CH₄ was oxidized to form CO₂

O₂ was reduced to form CO₂+H₂O

C: -4 → +4 (increase in ox#)
⇒ OXIDIZED

O: 0 → -2 (reduction in ox#)
⇒ REDUCED

CH₄ "caused" O₂ to be reduced!
⇒ CH₄ is the reducing agent

O₂ "caused" CH₄ to be oxidized!
⇒ O₂ is the oxidizing agent!