

Oxidizing and reducing agents

are key components in redox reactions, where electrons are transferred between substances.

Oxidizing agents (oxidants) accept electrons and are reduced in the process. They cause other substances to lose electrons and become oxidized. Examples of oxidizing agents include:

Oxygen (O₂)

Hydrogen peroxide (H₂O₂)

Halogens (F₂, Cl₂, Br₂)⁴⁵

Reducing agents (reductants) donate electrons and are oxidized in the process. They cause other substances to gain electrons and become reduced. Examples of reducing agents include:

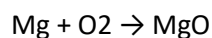
Hydrogen (H₂)

Carbon monoxide (CO)

Alkali metals (Li, Na, K)⁷⁹

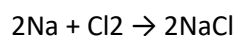
Examples of Redox Reactions

Combustion of magnesium:



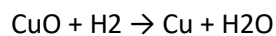
Here, magnesium is the reducing agent, and oxygen is the oxidizing agent⁷.

Formation of sodium chloride:



Sodium acts as the reducing agent, while chlorine is the oxidizing agent¹¹.

Reduction of copper oxide:



Hydrogen serves as the reducing agent, and copper oxide is the oxidizing agent³.

These reactions demonstrate the transfer of electrons between substances, with oxidizing agents gaining electrons and reducing agents losing them.

Let's break down the reaction

Mg + O₂ → MgO in detail:

Reactants:

Mg: Magnesium (a metal)

O₂: Oxygen gas (a non-metal)

Product:

MgO: Magnesium oxide (an ionic compound)

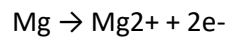
Explanation of the Process:

Electron Transfer:

Magnesium atoms lose electrons to become Mg^{2+} ions.

Oxygen atoms gain electrons to become O^{2-} ions.

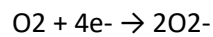
Oxidation:



Magnesium is oxidized (loses electrons).

Magnesium is the reducing agent.

Reduction:



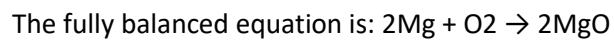
Oxygen is reduced (gains electrons).

Oxygen is the oxidizing agent.

Ionic Bond Formation:

The Mg^{2+} and O^{2-} ions are attracted to each other, forming an ionic bond.

Balanced Equation:



This reaction is exothermic, releasing energy in the form of heat and light, which is why burning magnesium produces a bright white flame.

Periodic Table

1 H Hydrogen																	2 He Helium														
3 Li Lithium	4 Be Beryllium															5 B Boron	6 C Carbon	7 N Nitrogen	8 O Oxygen	9 F Fluorine	10 Ne Neon										
11 Na Sodium	12 Mg Magnesi...															13 Al Aluminium	14 Si Silicon	15 P Phosph...	16 S Sulfur	17 Cl Chlorine	18 Ar Argon										
19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Mangan...	26 Fe Iron	27 Co Cobalt	28 Ni Nickel	29 Cu Copper	30 Zn Zinc	31 Ga Gallium	32 Ge Germani...	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton														
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybde...	43 Tc Techneti...	44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	47 Ag Silver	48 Cd Cadmium	49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon														
55 Cs Caesium	56 Ba Barium	57 La Lanthan...	72 Hf Hafnium	73 Ta Tantalum	74 W Tungsten	75 Re Rhenium	76 Os Osmium	77 Ir Iridium	78 Pt Platinum	79 Au Gold	80 Hg Mercury	81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon														
87 Fr Francium	88 Ra Radium	89 Ac Actinium	104 Rf Rutherfo...	105 Db Dubnium	106 Sg Seaborg...	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitneri...	110 Ds Darmsta...	111 Rg Roentge...	112 Cn Coperni...	113 Nh Nihonium	114 Fl Flerovium	115 Mc Moscovi...	116 Lv Livermor...	117 Ts Tenness...	118 Og Oganes...														
																		58 Ce Cerium	59 Pr Praseod...	60 Nd Neodym...	61 Pm Prometh...	62 Sm Samarium	63 Eu Europium	64 Gd Gadolini...	65 Tb Terbium	66 Dy Dysprosi...	67 Ho Holmium	68 Er Erbium	69 Tm Thulium	70 Yb Ytterbium	71 Lu Lutetium
																		90 Th Thorium	91 Pa Protacti...	92 U Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californi...	99 Es Einstein...	100 Fm Fermium	101 Md Mendele...	102 No Nobelium	103 Lr Lawrenc...

- Alkali metals
- Alkaline earth metals
- Transition metals
- Post-transition metals
- Metalloids
- Reactive non-metals
- Noble gases
- Lanthanides
- Actinides
- Unknown properties