1.In the compound H_2O (water), the oxidation number of the hydrogen atoms is +1 and the oxidation number of the oxygen atom is -2. This is because the oxygen atom has a higher electronegativity than the hydrogen atoms, so it attracts the shared electrons in the covalent bond towards itself more strongly. As a result, the hydrogen atoms have a positive oxidation number and the oxygen atom has a negative oxidation number.

2.In the compound NaCl (table salt), the oxidation number of the sodium atom is +1 and the oxidation number of the chlorine atom is -1. This is because the sodium atom has a lower electronegativity than the chlorine atom, so it loses an electron to the chlorine atom in order to form a bond.

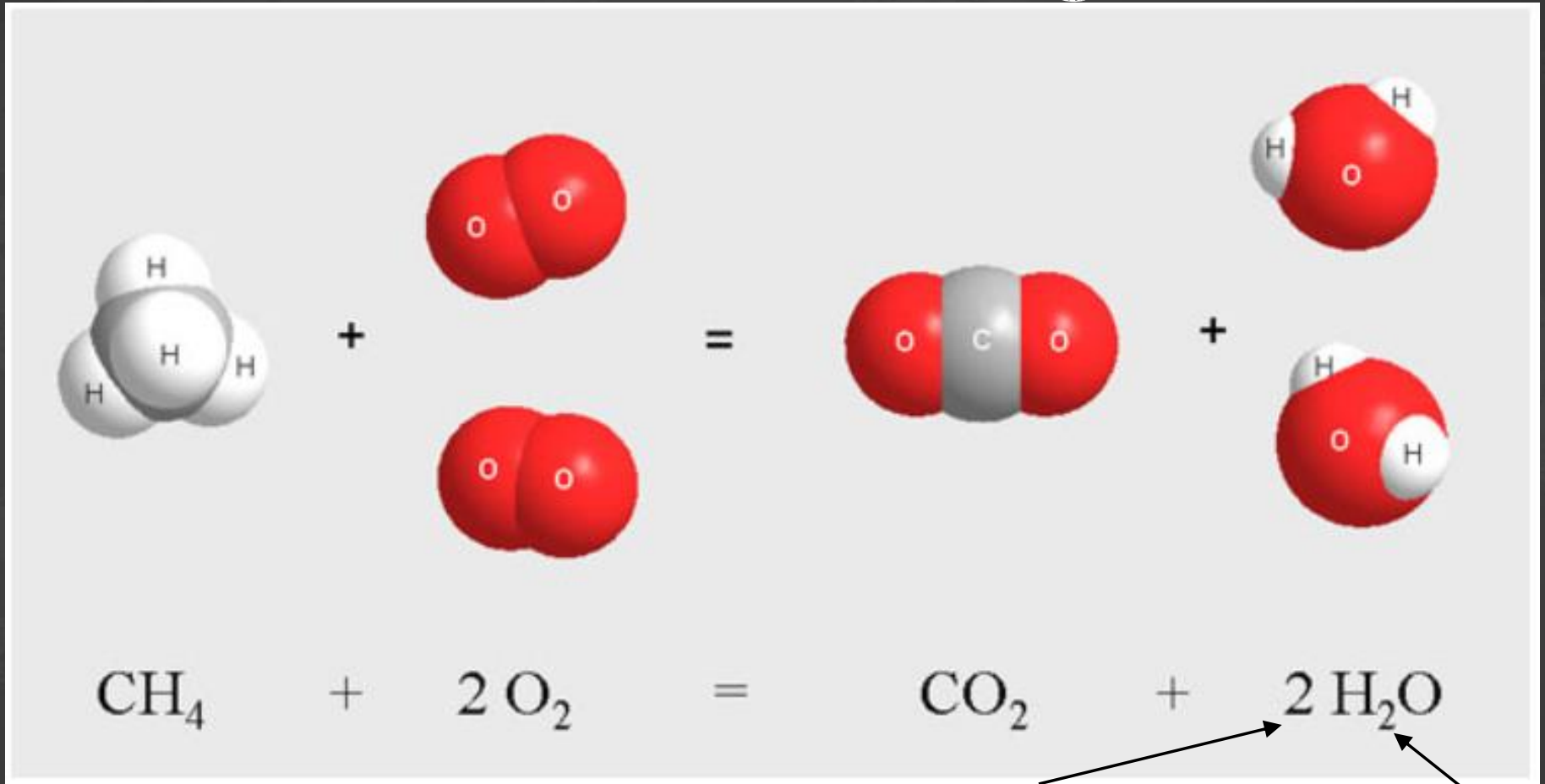
3.In the compound Fe_2O_3 (iron oxide), the oxidation number of the iron atoms is +3 and the oxidation number of the oxygen atoms is -2. This is because the iron atoms have a higher electronegativity than the oxygen atoms, so they attract the shared electrons in the covalent bonds towards themselves more strongly. As a result, the iron atoms have a positive oxidation number and the oxygen atoms have a negative oxidation number.

Find mistake in this text.

Chemical reactions

In chemical reactions substances with certain compositions and properties turn into different substances with different compositions and properties BUT the nuclei of atoms DO NOT change.

Combustion of methane in oxygen from the air



$$CH_4 + 2\,O_2 = CO_2 + 2\,H_2O$$

Coefficient shows how many molecules participate or form in the reaction

Index shows the number of atoms in a molecules

Combustion reaction

reactants products

$$CH_4 + 2\,O_2 = CO_2 + 2\,H_2O$$

The number of atoms for each element is the same in the left and the right parts of the equation.

To equate the number of atoms in the left and the right parts of the equation we use coefficients that we write in front of the molecular formulas.

Unlike in math equations, left and right parts of chemical equations cannot be exchanged.

Combination (synthesis) reaction

$$CaO + H_2O \rightarrow Ca(OH)_2 \downarrow$$

Decomposition reaction

$$Ca(OH)_2 \xrightarrow{\Delta} CaO + H_2O$$

Yield symbol

Single and double replacement reactions

$H_2 + CuO \rightarrow Cu + H_2O$ (redox reaction)

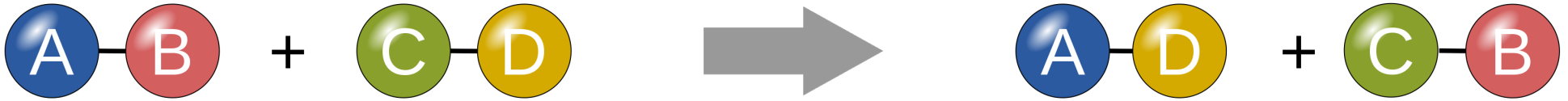
$Zn + 2HCl \rightarrow H_2\uparrow + ZnCl_2$

$CaBr_2 + 2HF \rightarrow CaF_2\downarrow + 2HBr$

Synthesis

Decomposition

Single replacement



Double replacement